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JPRS-UBB-85-017

7 June 1985

USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

19990514 109

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LIFE SCIENCES
BIOMEDICAL AND BEHAVIORAL SCIENCES

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AGROTECHNOLOGY

UDC 636.085

PRODUCTION OPERATIONS FOR STARTER MIXED FEEDS

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 2, Feb 85 pp 35-37

[Article by V. Bykov, chairman, kray association "Krasnodarskoye" for feed production under the heading="Of Feeds as of Bread"]

[Text] The Kuban is justly considered the major Russian agricultural zone. The farms of the kray comprise millions of cattle, swine and sheep and at least twenty million head of poultry. For this reason it is not surprising that the feed problem has particular urgency in such a situation.

An interfarm mixed-feed industry has been created and is now developing within the system of the agroindustrial association of Krasnodar Kray. It is based on 18 mixed-feed plants with a 980-ton capacity per shift, a production plant with a capacity of 2,700 tons of dry feed yeast per annum and capacity to produce 11,000 tons of protein-vitamin yeast annually, two production plants for meat and bone meal, three plant sections for production of dry whole-milk substitute and six interfarm plant sections for production of extruded feed and carbamide concentrate. Besides, 120 mixed-feed plant sections with a capacity of 1,800 tons per shift are operating at the kolkhozes and sovkhoses of the kray. At all enterprises production lines have been installed that make it possible to enrich mixed feeds with dry beet pulp, molasses, oil and by-products of canning.

In eight months of last year alone, all these enterprises and plant sections of our kray produced almost a million and a half tons of mixed feed. In addition, they processed 1,950 tons of feed yeast, 15,000 tons of protein-vitamin yeast, 26,800 tons of extruded feed, 1,200 tons of meat and bone meal, 2,220 tons of dry milk substitute, 1,650 tons of protein-enzyme concentrate, 2,800 tons of straw concentrate briquettes and 65,000 tons of starter mixed feeds.

To obtain a greater protein yield for production of mixed feeds, the interfarm enterprises introduced the so-called coefficients

of exchange. For example, for a ton of peas delivered to the plant the farm is allotted two tons of mixed feed, for a ton of soy three tons, and for a ton of top-grade grass meal one and one-half tons.

The forage grain yield in 1984 exceeded that in 1983 by 179,000 tons; the yield of peas by 16,900 tons and that of grass meal by 10,000. From these components alone (with the addition of dry beet pulp, molasses, premixes and minerals) over 400,000 tons of half-ration mixed feed will be processed.

In order to utilize protein feeds and forage grain more effectively and to maximize the productivity of young animals, our plants organized mass production of starter mixed feeds for breeding stock of various groups of half-grown animals. Recipes for mixed feeds have also been developed, making possible savings of scarce and expensive protein components.

At the "Vyselkovskiy," "Leningradskiy," "Primorsko-Akhtarskiy," "Timashevskiy," "Otradnenskiy," and "Mostovskiy" plants for the processing of starter feeds lines have been set up for stripping hull crops. Moreover, on finishing lines here special sieves make it possible to produce mixed feed with a specific particle size.

At the "Novopokrovskiy," "Krasnogvardeyskiy," "Novonikolayevskiy" and "Korenovskiy" plants the production of mixed starter feeds with an extruded grain component has become operational. Especially good results are obtained with extrusion of peas. The nutritive value of the dried matter from the peas is higher by over 10 percent and the digestible protein content is 20 percent higher. The manufacture of mixed feed with a component of 20 percent extruded peas, 4 percent feed yeasts and 4 percent bone meal has led to greatly reduced losses of piglets and to an increase of their weight at weaning to 17 kg in the zone where the plants operate.

The concentrates processed at the plants are highly nutritious and palatable, eaten up very well by the animals. One feed unit contains no less than 130 grams of digestible protein.

At present, in rayons where interfarm enterprises operate, almost all forage grain is consumed in the form of mixed feeds and mixtures with balanced nutritive substances. On the basis simply of feeding animals mixed feed containing grain forage, grass meal and coarse and fine oilseed cake, the production of dairy cows increased in 1983 by 290 kg altogether per capita of forage cattle in the region as a whole, by 379 at farms in Krymskiy

Rayon, by 381 at those of Primorsko-Akhtarskiy Rayon, by 416 in Vyselkovskiy Rayon and by 423 kg in Dinskiy Rayon. In the kray as a whole in the first half of 1984 the milk yield from forage cows was up to 100 kg more than for the same period in 1983.

The "Vyselkovskiy" interfarm mixed-feed plant brought the most significant success to animal raisers. Merely by the use of forage grains in the form of mixed feed, meat production in the rayon rose by more than 4,000 tons compared to the corresponding period of the previous year, while the number of head of cattle remained constant. Each month "Vyselkovskiy" produces 8,000 tons of mixed feed from 15 recipes. It also manufactures mixed feeds for piglets from 9 to 104 days old. The rational use of grain forage for breeding stock allows more than 40,000 swine to show an average daily weight gain of 550 grams.

Naturally, in order to increase production of plant protein, it is necessary to expand the sowing of perennial grasses. And now in Vyselkovskiy Rayon the area planted to these increased by 17,500 hectares. Pea culture was increased to 5,600 hectares and soy to 2,000 hectares.

For the sake of uniformity in the management of mixed feed plants and production units in the kray, a specialized interfarm association was created. A long-term program of increased production and improved quality was worked out through 1990 and is being accomplished. One of its priorities is producing feed additives for local animal breeding.

Work has been started on the "Adygeyskiy" plant at which distillery grains are processed. In a year this enterprise produces 2,700 tons of dry feed yeasts and 11,000 tons of protein additives. The plant has also put into operation production of whole-milk substitute on a non-dairy basis.

The technical process by which the substitute is produced consists in several operations. At the beginning liquid feed yeasts are produced from distillery grains. For this cells of feed yeasts are propagated and protein is cultivated in a solution up to 2.2 percent. Then a yeast suspension is produced: liquid feed yeasts are thickened until the proportion of dry matter reaches not less than 10 percent and protein not less than four percent. The yeast suspension undergoes hydrolysis in a reactor at 45-50 degrees with the enzymes pectofoedin (PUH) and protosubtilin (GSH). At the same time, ground maize is heated in an S-12 mixer at 90 degrees for one hour. After cooling to 55-60 degrees aminosubtilin GSH, pectofoedin PUH, salt and yeast suspension are added. Two hours after cooling a complex of vitamins A₁,

D₂, grisein and margarine is added and the result is thoroughly mixed in a mixer. The finished whole-milk substitute is placed in an SB 1.5 oven and dried at a temperature of 500-700 degrees. After drying the product is fragmented using a hammer-driven crusher and packaged in 20-25-kg paper bags.

The technological, microbiological and organoleptic quality control of the raw materials and finished products is carried out by the plant laboratory in conformance to the currently valid instructions.

The whole-milk substitute without dairy products is added to starter mixed feed and fed to calves, lambs, and piglets in the lactation period. Besides, it serves as a protein additive in chicken feed.

In addition to output of dry whole-milk substitute, operations at the "Adygeyskiy" plant include production of protein-enzyme concentrate used as a protein additive for processing of mixed feeds intended for cattle and sheep. The protein enzyme concentrate is a fine powder obtained by drying on an SB 1.5 drum dryer mixtures of yeast suspension, fragments (from distillery grains), diammoniumphosphate, calcium chloride, sodium chloride and enzyme preparations. Sunflower-seed shells, straw and apple or grape pressings are used as filler. The standard protein-enzyme concentrate contains not less than 16 percent digestible protein.

For the manufacture of protein-enzyme concentrate, for 1000 kg of dry product, the ingredients are 800 kg sunflower shells, or 700 kg apple or grape pressings, 150 kg dry pellets, 1600 kg of 10-percent yeast suspension, 4 kg calcium chloride, 4 percent evaporated salt, 2 kg pectofetidin GSH and 2 kg celloveridin.

Six thousand tons annually of this type of concentrate is produced. The industrial operating procedure and technical instructions for production of dry substitute for whole milk and protein enzyme concentrate have been developed by scientists at the All-Union Scientific Research Institute for Biotechnology.

In one year the kolkhozes and sovkhoses of the kray sell to the state not less than 465,000 tons of milk. Processing at the Krasnodar association of the dairy industry yields 300,000 tons of whey, a valuable product in which 50 percent dehydrated milk solids remains. The dehydration of whey can yield an excellent

addition to the diet of a young animal or to production of whole-milk substitute. A ton of dry whey (containing 2.6-6.5 percent fat, 12-14 percent protein and 63-73 percent lactose and minerals) is used as an additive in mixed feed and increases the live weight of animals by four tenths of a ton; it significantly lowers the cost of concentrates.

In Kuban, construction is now nearing completion of an inter-kolkhoz plant for production of dry whey and 11 smaller facilities for its preliminary concentration. The plant will process 13,000 tons annually.

Great importance is also attached to the production of meat and bone meal. New plants are being built and existing ones reconstructed. In the very near future they should be producing over 5,000 tons of meat and bone meal.

Moreover, much is being done to increase production of grass meal. At three plants additional equipment is being installed. In the kray as a whole, production of 350-450 thousand tons is expected.

At many of the enterprises referred to above, plant sections have been started up for the manufacture of briquette feed composed 60-80 percent of straw. For example, the inter-kolkhoz mixed-feed plant built in 1981 at Otradnenskiy produces 100 tons of briquettes per day. This has made it possible to enrich a considerable portion of the straw for cattle and sheep with feed additives, thus improving the edibility and digestibility of straw fed to animals.

As shown by studies, conducted by associates of the Krasnodar Polytechnic Institute, when by-products were utilized and different additives obtained in vegetable processing from the Krymskiy canning combine were included in mixed feed, Krymskiy Rayon in itself was able to increase production of mixed feeds by 20,000 tons. The savings achieved reached 100,000 rubles per annum.

In 1984 the Krymskiy canning combine put into operation the first production line utilizing processing by-products which were subsequently given over to the "Krymskiy" interfarm mixed-feed plant.

A solution is also being found to the problem of processing food wastes, which in Sochi Rayon are gathered in the amount of 25-30 thousand tons per annum. However, the largest part of them remains unused because they are hard to transport. Now a resolution has been adopted calling for construction of a plant to

process these wastes into granulated feeds. The factory will produce annually 7,800 tons of granulated feeds with a crude protein content of 29 percent.

As shown by the calculations of the North Caucasus Scientific Research Institute for Animal Breeding, cattle breeding stock maintained at the complexes and animal farms of Krasnodar Kray require 177 tons of carotene annually. Only 145 tons reach the animals through food. Therefore, a resolution has now been adopted calling for the construction of an inter-kolkhoz plant for production of a dietary feed preparation of microbiological carotene at the rate of 10 tons annually.

The dietary preparation of microbiological carotene will contain, besides biologically active substances, vitamins B₁, B₂, B₃, PP and E, 82-92 percent dry matter, 25 percent protein in dry matter and 5.5 percent crude fat. The value of the preparation also consists in its content of the most active form of carotene with 99.7 percent of the total carotenoids made up of beta carotene.

The zootechnical, biological and cost-reducing efficacy of dietary preparations of microbiological carotene as a mixed-feed additive has undergone many examinations by scholars and practical workers studying various animal species in different soil and climatic zones.

In the line of our plants and plant sections there is construction of facilities for processing wastes of sunflower seeds and sugar beets and lines for production of mineral salt briquettes and premixes. For example, the interfarm mixed-feed plant "Vyselkovskiy" has started up production of premixes for the young of cattle, suckling and weaned pigs and for fattening immature swine intensively with guaranteed weight gains.

In concluding I will cite some of the most interesting recipes for starter mixed feeds. The interfarm mixed-feed plants of Krasnodar Kray use these recipes for processing starter mixed feed.

Mixed feed for suckling pigs 15-43 days old produced by the Vyselkovskiy plant. Hulled barley (45 percent), maize (10 percent) peas (5 percent), bran (6 percent), sunflower-seed meal (5 percent), meat and bone meal (5 percent), grass meal (3 percent), hydrolized yeast (5 percent), dry whey (10 percent), sugar (5 percent) and P-51-5 premix (1 percent).

This mixed feed contains, per kilogram, 1-12 feed units, 17.8 percent crude protein, 4.2 percent cellulose, 0.5 percent calcium, 0.4 percent phosphorus and 0.3 percent sodium.

Starter mixed feed for piglets age 9-42 days, produced by the "Leningradskiy" plant: maize (10 percent), hulled oats (5), hulled barley (28), wheat (5), wheat bran (2), oilseed (sunflower or soy) meal (10), peas (3), grass meal (1), meal (meat and bone, bone, fish) (4.5), feed yeast (2.5), dry defatted milk or dry whey (20), dietary phosphate (0.4), calcium chloride (0.3), salt (0.3), SK-3 premixes (1), sugar (5), animal fat (1.5) and lecithin (0.5).

A kilogram of this mixed feed contains: 1.12 feed units, 220--crude protein, 42--crude fat, 29--crude bran.

Starter mixed feed for piglets aged 43-60 days ("Leningradskiy" plant): maize (10 percent), hulled barley (40), wheat bran (12.8), oilseed meal (sunflower or soy) (11), grass meal (2), meal (bone, meat and bone, fish) (4.8), feed yeast (4), dry defatted milk or dry whey (9.3), calcium chloride (1), sodium chloride (0.4), premixes (1), sugar (2.2), animal fat (1) and lecithin (0.5).

In a kilogram of mixed feed are contained: 1.18 feed units, 185 grams of crude protein, 46--crude fat and 41--crude bran.

Starter mixed feed for young pigs during maturation ("Vyselkovskiy" plant): hulled barley (50.5 percent), wheat bran (10), sunflower or soy meal (13), meal (meat and bone, bone, fish) (4), feed yeasts (2.5), dry defatted milk or dry whey (10), dietary phosphate (1), calcium chloride (0.6), sodium chloride (0.4), premixes (1), sugar (5) and animal fat (2).

A kilogram of the mixed feed contains: 1.12 feed units, 203 grams crude protein, 42 crude fat and 32 crude bran.

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NOTED SCIENTIST CELEBRATES 75TH BIRTHDAY

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 5, May 84 p 63

[Article: "Corresponding Member of the USSR Academy of Sciences Nikolay Nikolayevich Mel'nikov is 75 Years Old"]

[Text] Professor Nikolay Nikolayevich Mel'nikov, corresponding member of the USSR Academy of Sciences, recipient of the USSR State Prize and doctor of chemical sciences, recently celebrated his 75th birthday.

N. N. Mel'nikov dedicated his entire life to the creation and development of chemical means for protecting plants from pests, diseases and weeds as well as of means for protecting animals from ectoparasites and endoparasites. With his active participation preparations such as granosan, merkuran, ethylmercurphosphate, copper trichlorphenolite, parathion, metaphos [Methyl parathion], chlorophos, carbophos, polycarbazine, gidrel and others, which are widely utilized in the practice of agricultural production, were developed and introduced.

N. N. Mel'nikov has made a considerable contribution to the development of the theoretical bases of science as related to pesticides and the mechanism of action of insecticides, fungicides, herbicides and defoliants. In recent years Professor Mel'nikov has been directing work on studying new insecticides, acaricides and nematocides, pheromones and regulators of plant growth.

N. N. Mel'nikov is the author of over 800 scientific articles, many of which have been published abroad, as well as of over 500 attestations and patents. He has written over 25 monographs. It is necessary to note his outstanding research on the chemistry of phosphoro-organic compounds and on the mechanism of physiologic activity of this class of compounds.

Nikolay Nikolayevich has great scientific erudition, which has helped him to successfully carry out the obligations of editor-in-chief of the journal AGROKHIMIYA and of deputy editor-in-chief of the journal KHIMIYA V SEL'SKOM KHOZYAYSTVE.

N. N. Mel'nikov is the creator and recognized head of the Soviet school of specialists in the area of pesticides.

The editors of the journal KHIMIYA V SEL'SKOM KHOZYAYSTVE warmly congratulate the dear celebrant on his 75th birthday and wish him good health and further creative successes in his multifaceted scientific activity.

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CSO: 1940/1045

UDC 632.95.024.1

TOXICITY OF PESTICIDES EXAMINED

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 5, May 84 pp 59-60

[Article by G. V. Merenyuk, doctor of medical sciences, N. N. Karlina, candidate of biological sciences, Ye. Ye. Yemnova, candidate of biological sciences (Department of Microbiology of the Moldavian SSR Academy of Sciences): Toxicity of Metaphos [Methyl parathion] and Bazudin [Further expansion unknown] for Pure Cultures of Soil Microorganisms"]

[Text] In order to standardize chemically-toxic substances in the soil it is important to understand their action on microorganisms found in the soil. However, the effect of phosphoro-organic pesticides on soil microflora has been studied insufficiently. At the first stage of research it would be expedient to determine their antimicrobial properties as related to cultures of test microorganisms. The literature contains reports on the correspondence of results of laboratory and field experiments (1-3).

With the goals of studying the antimicrobial action of hundreds of new compounds within a short period of time, of determining which preparations are most active biologically as well as of establishing which of the test-microbes are most sensitive, we developed a system to evaluate pesticides for their antimicrobial properties (2). The basis of the toxicological evaluation of pesticides was the indicator for the average bacteriostatic action of BD50 [Further expansion unknown]--the concentration of the substance at which the multiplication of 50 percent of the microorganisms' cells is suppressed.

In considering production norms for the expenditure of pesticides, we can assume that the most dangerous, from the point of view of unfavorable effect on microbiocenosis, are the compounds with significant average bacteriostatic concentrations of up to 10 milligrams per liter.

The accelerated culture-morphological method (4) was utilized on leakproof culture media for the initial toxicological evaluation of metaphos and bazudin. The objects of the study were 19 types of microorganisms which included ammonificators, nitrogen-fixing microorganisms and microorganisms that decompose cellular tissue. Metaphos and bazudin are derivatives of thiophosphoric acid differing in the structure of side substituents.

Average Bacteriostatic Concentrations of Metaphos and Bazudin,
milligrams/liter

Microorganisms	Metaphos	Bazudin
1. <i>Bacillus mesentericus</i>	1.1	9.5
2. <i>Bacillus megaterium</i>	0.5	2.6
3. <i>Clostridium butyricum</i>	2.7	1.5
4. <i>Azotobacter chroococcum</i>	2.4	5.3
5. <i>Pseudomonas fluorescens</i>	0.7	181.2
6. <i>Pseudomonas stutzeri</i>	0.6	13.9
7. <i>Polysporium cellulosum</i>	8.3	1000
8. <i>Sarcina lutea</i>	126.1	1000
9. <i>Mycobacterium rumbrum</i>	5.3	12.7
10. <i>Streptomyces bacillaris</i>	1.9	17.1
11. <i>Streptomyces raffinosus</i>	1.5	44.5
12. <i>Streptomyces fulvoviridis</i>	2.1	41.0
13. <i>Streptomyces streptomycini</i>	2.7	13.1
14. <i>Aspergillus niger</i>	0.06	1000
15. <i>Penicillium glaucum</i>	1.5	59.0
16. <i>Trichoderma lignorum</i>	2.3	26.9
17. <i>Fusarium moniliforme</i>	1.2	50.6
18. <i>Rhodotorula gracilis</i>	0.09	6.0
19. <i>Candida utilis</i>	1.2	76.5

Note. Microorganisms participating in the following processes: ammonification--1, 2, 5, 8, 10-19; denitrification--5 and 6; nitrogen-fixation--3 and 4; and decomposition of cellular tissue--7, 9, 10-19.

Metaphos was characterized by a significantly greater toxicity than bazudin for the microorganisms under study (table). Microorganisms of all classifications (bacteria, actinomycetes and fungi) were highly sensitive to metaphos. Thus, according to the classification scheme for pesticides proposed by us involving their antimicrobial properties (2), metaphos should be included among the highly toxic preparations.

The antimicrobial properties of bazudin are less pronounced, but bacteria (BD50 value of 1.5-9.5 milligrams per liter) and some fungi are sensitive to it, which allows us to categorize this preparation among the toxic compounds.

We know that the physiologic action of pesticides depends on the characteristics of their chemical structure. A comparison of acquired data and the chemical structure of preparations is in agreement with the well-known fact of the strong toxicity of nitrophenols. The presence of this group in a molecule of metaphos imparts a special toxicity on this phosphoro-organic compound.

In comparative toxicological studies an important characteristic is the indicator of the zone of toxic action. For the fungus *Asp. niger* the zone of

toxic action of metaphos equals 0.02-0.1 milligrams per liter; for the fungus *Rh. gracilis*--0.04-0.8 milligrams per liter. The zone of action of bazudin for *Az. chroococcum* equals 0.5-50 milligrams per liter. Actual residual quantities of phosphoro-organic pesticides in the soil equal 0.4-1 milligrams per liter.

On the whole, the experiments attest to the strongly manifested antimicrobial action of metaphos and bazudin. In low concentrations (from a hundredth part of a milligram to several milligrams per liter) these pesticides partially or fully suppress the development of the majority of soil microorganisms studied. A selective toxicity of pesticides to certain types of microorganisms--*Asp. niger*, *Rh. gracilis*, *Az. chroococcum*--has been established. These microorganisms can be used as a biological test of residual amounts of metaphos and bazudin in the soil.

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CSO: 1940/1045

UDC 631.85:633.11"321":631.51.01

PHOSPHORUS UPTAKE BY SPRING WHEAT FROM DIFFERENT HORIZONS OF TILLED SOIL IN
SUBSURFACE CULTIVATION

Moscow AGROKHIMIYA in Russian No 2, Feb 85 (manuscript received 14 May 84)
pp 16-21

YERMOLAYEV, O. T., MAYSTRENKO, N. N. and RUD', I. T., All-Union Scientific
Research Institute of Grain Farming, Tselinograd Oblast

[Abstract] Studies were conducted on the effects of subsurface cultivation on phosphorus uptake by spring wheat (Saratov 29) from the different horizons of tilled soil, in the case of carbonate chernozem prevalent in the Tselinograd Oblast. In general, loss of phosphorus from the soil due to plant assimilation was highly dependent on the climatic conditions, increasing in years with considerable precipitation, and decreasing in years with considerable precipitation, and decreasing in years with relatively low precipitation. Available phosphorus was sharply demarcated in the tilled soil (0-25 cm), with approximately 39% located in the upper 0-5 cm layer, and a gradual decrease to about 7% at the 20-25 cm layer. The greatest assimilation of phosphorus occurred from 5-10 cm below the level of seed embedding, i.e., the 10-15 cm horizon, which account for 32.7-45.3% of the total phosphorus entering the root system. References 9: 8 Russian, 1 Western.
[1047-12172]

UDC 631.89:631.445.24

EFFECTS OF NITROGEN AND PHOSPHORUS FORM ON EFFECTIVENESS OF COMPOUND
FERTILIZERS IN SODDY PODZOLIC SOILS. PART 3. SOIL PHOSPHATE STATUS

Moscow AGROKHIMIYA in Russian No 2, Feb 85 (manuscript received 29 Jun 84)
pp 22-28

YANISHEVSKIY, F. V., KUZ'MENKOVA, A. V. and FILATOVA, L. M., Scientific
Research Institute for Fertilizers and Insectofungicides, Moscow

[Abstract] The phosphate status of soddy podzolic soils was assessed in relation to the forms of nitrogen and phosphorus fertilizers utilized over

7 June 1985

a five year period (1972-1976) on lightly clayey soil. Carboammophosphate (KA-phosphates) was more effective than nitroammophosphate (NA-phosphates) during the first two years in increasing the levels of mobile phosphates, as well as of phosphate bound to mellow soil, in addition to promoting phosphate mobility itself. At the end of the study, differences were still apparent between the two forms of fertilizer, but were markedly diminished in degree. In addition, the initially beneficial effects of urea in promoting phosphate mobility weakened considerably. It became apparent that the use of carboammophosphates and mixed fertilizers with urea should be used for crops that have a relative short vegetation period to create optimum levels of assimilable phosphate, and when the entire fertilizer dose per crop rotation is used under a highly productive culture, as well as for local application. References 15: 14 Russian, 1 Western.
[1047-12172]

UDC 631.8:631.582:635.1/8:631.445.152

DETAILED ANALYSIS OF VARIOUS FERTILIZER SYSTEMS IN INTENSIVE VEGETABLE CROP
ROTATION ON ALLUVIAL MEADOWS

Moscow AGROKHIMIYA in Russian No 2, Feb 85 (manuscript received 13 Jun 84)
pp 29-36

BORISOV, V. A., Scientific Research Institute of Vegetable Farming, Moscow
Oblast

[Abstract] A detailed analysis was conducted on the effectiveness of various fertilization schemes in intensive vegetable crop (beets, cabbage, carrots, peas) cultivation on alluvial meadows prevalent in the Moscow region over the period 1975-1982. Under the conditions specified, cabbage and beets were found highly responsive to nitrogen fertilizer and carrots, to potassium and organic fertilizers. Optimum results were obtained by combination of complete mineral fertilizers with a single application (once per rotation) of manure (50 tons/ha) and green manure crop (30 tons/ha). With the optimum combinations (NPK + green manure crop; NPK + green manure crop, manure; NPK + green manure crop, manure, liming) yields of 600 to 800 centners/ha were common. Such a system assured high productivity of the crop rotations, high quality, and retention of soil fertility. References 11 (Russian).
[1047-12172]

UDC 631.82:664.38:633.11(470.31)

EFFECTS OF CLIMATIC CONDITIONS AND FERTILIZERS ON WINTER WHEAT PROTEIN
LEVELS AND AMINO ACID COMPOSITION IN NONCHERNOZEM ZONE

Moscow AGROKHIMIYA in Russian No 2, Feb 85 (manuscript received 18 Jan 84)
pp 37-46

IVANOVA, T. I. and KOZHEMYAKOVA, R. N., All-Union Institute of Fertilizers
and Agronomical Pedology, Moscow

[Abstract] The effects of climatic conditions and use of fertilizers on the protein concentrations and amino acid composition of Mironovskaya 808 winter wheat were studied in the nonchernozem zone on medium clayey soddy podzolic soil. The crop rotations consisted of barley, clover, winter wheat, barley, potatoes and oats. Regression analysis showed a strong correlation between changes in the amino acid composition and the increase in the protein content, although the factors leading to an increase in the protein concentration (nitrogen fertilizer or climatic conditions) were immaterial. Increasing the protein concentration from 9% to 15% resulted in a marked reduction in methionine, lysine, valine, aspartic acid, arginine, glycine and alanine, and an increase in glutamic acid, phenylalanine and proline. Other amino acids showed a modest decrease. The greatest increase in protein concentration was observed when the precipitation in May, June and July ranged from 200 to 230 mm, and the mean daily air temperature ranged from 15 to 17°C. The regression equations were found suitable for determining the probable amino acid composition of proteins on the basis of the protein concentration in the grain. Figures 1; references 14: 13 Russian, 1 Western.
[1047-12172]

UDC 631.811:633.11

INDIVIDUAL DETERMINATIONS OF OPTIMUM TOTAL DOSE OF N+P+K FERTILIZER AND
N:P:K RATIO ON WINTER WHEAT HARVEST IN APSHERON PENINSULA

Moscow AGROKHIMIYA in Russian No 2, Feb 85 (manuscript received 17 Jan 84)
pp 47-50

ALIYEV, N. T. and MARDANOV, A. A., Institute of Botany, Azerbaijan SSR
Academy of Sciences, Baku

[Abstract] The factorial method of D. B. Vakhmistrov [Agrokhimiya, No 4, 3, 1982] was used to determine the optimum fertilizer for winter wheat (Bezostaya 1) cultivation under the conditions prevalent in the Apsheron Peninsula, relying on the analysis of two factors: 1) total N+P+K dose in the fertilizer, and 2) N:P:K ratio. The results showed that this approach was reliable in determining optimum conditions of fertilization for the crop in question in the area. Optimum harvests were obtained with

N180P170K90. However, considering cost effectiveness factors and fertilizer production capacity, essentially equivalent results were obtainable with N120P110K60 combinations. Figures 4; references 6 (Russian); [1047-12172]

UDC 631.416.2

VARIABILITY IN RELATIVE OPTIMUM OF MOBILE PHOSPHORUS LEVELS IN
NONCHERNOZEM SOILS : LITERATURE REVIEW

Moscow AGROKHIMIYA in Russian No 2, Feb 85 pp 113-125

YEL'NIKOV, I. I. and PIVOVAROVA, I. A.

[Abstract] Review of the literature on the relative concentrations of mobile phosphorus in the various regions of the nonchernozem belt revealed that crop-related optimum concentrations ranged from 10 to 30 mg P_{2O_5} /100 mg of soil. The various studies have shown that the greater the amount of assimilable phosphorus available to plants, the greater is the probability of low levels of mobile phosphorus corresponding to an optimum for the region. Analysis of the soil chemistry in a given region should facilitate rational selection of fertilizers without contributing to an elevation of the phosphorus levels. Among the factors demonstrated to have a bearing on mobile phosphorus are humus content, mechanical characteristics of the soil, water content, temperature, acidity, and predicted losses of phosphorus due to plant uptake. References 113: 1 Czech, 2 Hungarian, 95 Russian, 15 Western. [1047-12172]

UDC 632.95

MECHANISM OF ACTION, METABOLISM AND DEGRADATION OF PYRETHROIDS

Moscow AGROKHIMIYA in Russian No 2, Feb 85 pp 126-134

BERZIN, V. B.

[Abstract] The 5th International Congress on the Chemistry of Pesticides held in September 1982 in Japan devoted a considerable amount of time to the mechanism of action and metabolism of the pyrethroid pesticides. The data presented at that time exercised considerable effect on subsequent research, demonstrating as they did the existence of specific pyrethroid-binding receptor which is sensitive to calcium ions, the effects of pyrethroids on sodium channel permeability, and the reaction of pyrethroids with GABA receptors. Studies were undertaken to identify enzymes responsible for specific stages of pyrethroid catabolism and transformation, the initial stages of which consist of breakage of the ester bond, oxidation of the acid and the alcoholic components, and conversion of the cyano group into

thiocyanate and carbon dioxide. Studies on degradation in the environment demonstrated the formation of a variety of products, many representing cis- and trans-cyclopropane carboxylic acids, depending on the specific insecticide in question. References 39 (Western), [1047-12172]

UDC 577.1.577.4

SPIKE VARIABILITY AND FLOUR PROTEIN AMINO ACID COMPOSITION OF TRITICALE IN RELATION TO GROWTH CONDITIONS

Dushambe DOKLADY AKADEMII NAUK TADZHISKIY SSR in Russian Vol 27, No 10, Oct 84 (manuscript received 27 Jun 84) pp 609-612

BOBODZHANOV, V. A., KORYAKINA, N. I., NIGMONOV, M., BURICHENKO, V. K. and NASYROV, Yu. S., academician, Tajik SSR Academy of Sciences, Institute of Plant Physiology and Biophysics, Tajik SSR Academy of Sciences; Institute of Chemistry imeni V. I. Nikitin, Tajik SSR Academy of Sciences

[Abstract] Spike variability and flour protein amino acid composition were assessed in relation to the growth conditions of two triticale forms that appear promising for Tajikistan--forms Vose-1 and GL-29. The plants were grown in Southern Tajikistan, Northern Tajikistan and the Gissar Valley. Analysis of the protein content of the flour and its amino acid composition, and spike evaluation (length and weight, number of spikelets, number and weight of grains per spike) demonstrated that the triticales exhibited a considerably wider range of variability than did Sieta-Cerros [sic] wheat grown in the same regions. These observations indicate that with proper breeding, triticale has great potential for adaptation to the different regions for optimum harvests. In addition, amino acid studies showed a well-balanced composition, and the flour protein levels were equivalent to, or exceeded, the levels in wheat. References 8 (Russian), [1770-12172]

BIOCHEMISTRY

UDC: 577.354:547.95

IRON ION BINDING BY SHIELDING PIGMENTS OF EYE OF VERTEBRATES AND INVERTEBRATES--
MELANOSOMES AND OMMOCHROMES

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 1, Jan-Feb 85
(manuscript received 2 Jul 84) pp 12-15

[Article by V. A. Lapina, A. Ye. Dontsov and M. A. Ostrovskiy, Institute of
Chemical Physics, USSR Academy of Sciences, Moscow]

[Text] Melanosomes of optic pigment epithelium tissue in vertebrates, synthetic dopa-melanin and ommochromes of the invertebrate eye efficiently bind bivalent iron ions. Estimates were made of constants of the binding process. Determination was made of concentration of endogenous iron in melanosomes of the pigment epithelium of the frog's eye. It was concluded that the mechanism of antioxidant action of eye shielding pigments may include binding of Fe^{2+} into inactive complexes.

The shielding pigments of the eye of vertebrates (melanoproteins) and invertebrates (ommochromes) serve as an optical screen that protects photosensitive optic cells against the effect of excessive light. However, this passive optic protection is apparently not the only function of pigments. Thus, we established that melanosomes and ommochromes have a marked antioxidant effect, which inhibits lipid peroxidation [1, 2]. It was demonstrated that pigment-containing tissues of the eye are more resistant to various prooxidant factors than cells without pigment [3, 4]. This is not related to differences in activity of antioxidative enzymes (superoxide dismutase, glutathione peroxidase), level of α -tocopherol and differences in sensitivity of oxidation substrates to prooxidants [5].

The mechanism of antioxidant action of shielding pigments is apparently related to Fe^{2+} complex formation and its change to an inactive form, although one cannot rule out an antiradical mechanism of their inhibitory effect. It is known that melanins can bind ions of iron [6].

We investigated here the capacity of shielding pigments--melanoproteins and ommochromes--to bind iron ions, and we determined the parameters of such binding.

Material and Methods

Melanosomes were isolated from pigment epithelial tissue of the eye of *Rana temporaria* frog [3], and ommochromes were extracted from the krill eye [2]. Dopa-melanin was synthesized by a previously described method [7]. Melanosomes were counted in a Goryayev chamber and scaled to dry weight of granules [8] (Figure 1). Total iron concentration in melanosome samples was measured by atom-adsorption spectrophotometry using a Perkin-Elmer (England) analyzer.

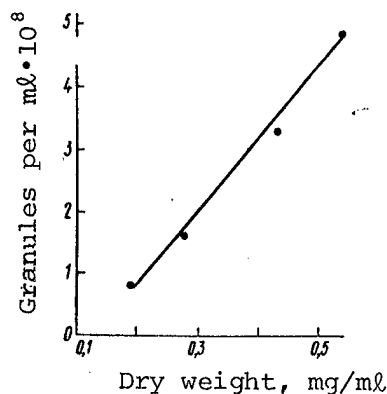


Figure 1.

Calibration curve for determining number of melanosomes

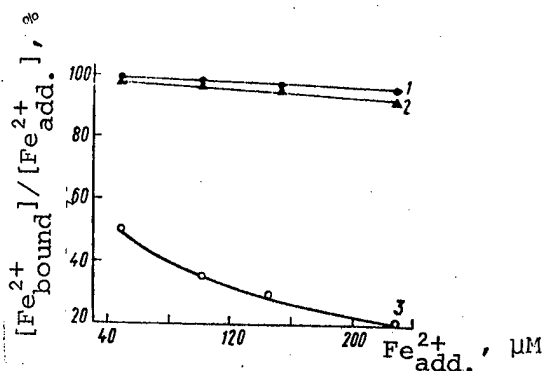


Figure 2.

Fe²⁺ binding by different fractions of pigment epithelium

- 1) original homogenate
- 2) melanosomes
- 3) pigment epithelium homogenate without melanosomes

Fe²⁺ concentration was determined on a Shimadzu MPS-5000 (Japan) spectrophotometer, according to formation of a complex with diethylenetriamine pentaacetate [9]. Samples containing different amounts of Fe²⁺ and shielding pigments (their concentration ranged from 100 to 500 μg/ml) were incubated for 30 min (pH 7.0). We used titrated solutions of Mohr's salt [ferrous ammonium sulfate], FeSO₄(NH₄)₂SO₄. Then the pigments were removed by centrifuging (5000 G, 15 min); we added diethylenetriamine pentaacetate (end concentration 5·10⁻⁴-10⁻³M) to the supernatant and incubated it for 1 h at 44°C. Optical density of the solution was measured at a wavelength of 312 nm. The coefficient of molar extinction of the complex was 5800.

Results and Discussion

A homogenate of pigment epithelial tissue from the frog's eye can bind considerable amounts of Fe²⁺ (Figure 2). The original homogenate of tissue from the pigment epithelium of four frog eyes was divided into two equal parts. The first was tested directly for sorption capacity (curve 1), while the second was first separated into melanosome fractions and homogenate without melanosomes (curves 2 and 3, respectively). The incubation medium consisted of 0.65% NaCl, 10 mM tris-HCl (pH 7.4). Removal of melanosomes from pigment epithelial cells by the method of differential centrifuging leads to substantial decrease in sorption capacity of the latter. At the same time, melanosomes isolated from

pigment epithelium cells bound Fe^{2+} with almost the same efficiency as the original homogenate. This warrants the conclusion that expressly melanin-containing melanosomes have the greatest capacity for Fe^{2+} sorption in pigment epithelium tissue.

The constants of Fe^{2+} binding with melanosomes and synthetic dopa-melanin indicate (Figure 3) that in both instances there are at least two types of binding sites. The maximum amount of iron bound with melanosomes and dopa-melanin is very high (see Table). However, in frog melanosomes it does not exceed 1% of the maximum and constitutes a mean of 45 ± 5 mg/100 g dry weight. This means that the capacity of melanosomes for binding free iron in a pigment epithelium cell is quite high.

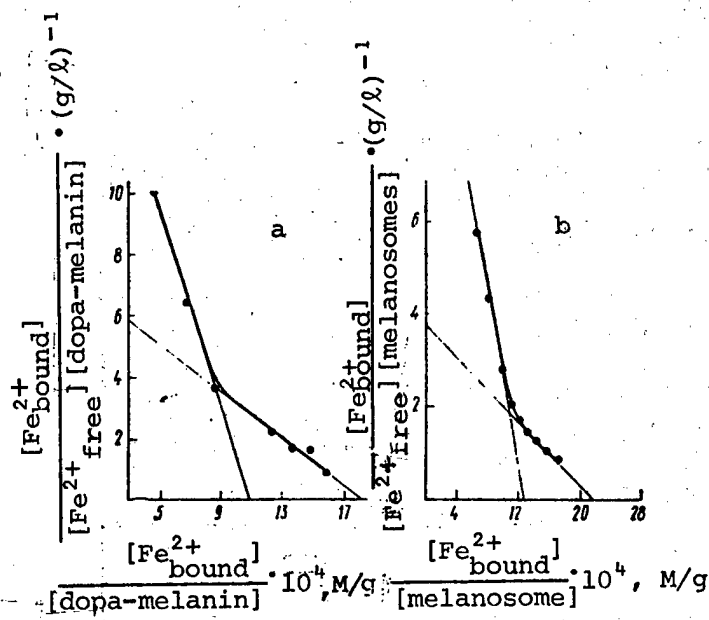


Figure 3. Skatchard graph for determination of constants of Fe^{2+} binding by dopa-melanin (a) and melanosomes (b)

It should be stressed that the amount of iron bound by melanosomes is larger by almost a factor of 10 than its level in, for example, the skeletal muscles of frogs [10].

Thus, melanosomes have exceptionally high absorption capacity with regard to ions of iron. Let us calculate the amount of iron that can be bound by one melanosome. Determination of quantity of melanosomes by counting them in a Goryayev chamber revealed that 1 mg dry weight melanosomes contains an average of $1.2 \cdot 10^9$ granules (Figure 1). Hence, one granule can bind at the most 10^9 ions of iron. Using data in the table, we also can find that one melanosome contains an average of $3 \cdot 10^8$ radicals of monomeric elements of indole-5,6-quinone.

Constants of Fe^{2+} binding by optic shielding pigments

Pigment	Binding constants		Maximum binding with saturation, mg iron/g dry wt. of pigments	Maximum binding per monomer*
	$K_1, \text{M}^{-1} \cdot 10^4$	$K_2, \text{M}^{-1} \cdot 10^3$		
Dopa-melanin	2.0 ± 0.3	4.0 ± 0.1	100 ± 5	0.26 ± 0.02
Melanosomes	1.5 ± 0.5	2.0 ± 0.1	110 ± 10	0.30 ± 0.04
Ommochromes	2.4 ± 0.8	-	70 ± 15	1.00 ± 0.15

*Molecular mass of monomeric element of melanin is considered to be 150 dalton and that of ommochromes, 800.

We established for the first time that ommochromes (like melanins) are capable of binding iron ions. The maximum amount of the latter bound by ommochromes is also quite considerable (see Table). The binding constant is close in value to the one for melanosomes; however, there is apparently one type of iron binding sites. Perhaps this is related to the fact that, as we demonstrated in preliminary experiments [11], ommochromes oxidize Fe^{2+} to Fe^{3+} , and they bind only trivalent iron, whereas melanins can bind both Fe^{2+} and Fe^{3+} .

It is important to emphasize that shielding pigments, which form complexes with Fe^{2+} , change it into inactive pigment- Fe^{2+} or pigment- Fe^{3+} complexes which, even in the presence of ascorbic acid, are incapable of inducing the reaction of lipid peroxidation [3].

Thus, our results indicate that shielding pigments of the eye can participate in controlling concentrations of iron ions in the cell and, consequently, in controlling lipid peroxidation. It is known that the cells of the eye's pigment epithelium contain a large amount of phagocytized fragments of external segments of photoreceptor cells [12]. The mechanisms of utilization of these fragments perhaps include lipid peroxidation [13]. For this reason, melanosome control of Fe^{2+} concentration as prooxidants could be very important to metabolism of the eye's pigment epithelium cells.

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10,657
CSO: 1840/1814

UDC 615.355.12

IMMOBILIZED RESTRICTASES Sal I AND PVU II

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 85 (manuscript received 4 Apr 84) pp 32-33

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[Abstract] Conditions are described for the immobilization of restrictase enzymes Sal I (derived from *Streptomyces albus*) and PVU II (*Proteus vulgaris* ATCC 13315) on cyanogen bromide-activated Sepharose 4B, yielding preparations with specific activities of 50 (arbitr.) U/ml. Both preparations were effective in hydrolysis of phage lambda DNA and DNA derived from *Neisseria meningitidis*, with the products showing identical electrophoretic patterns to those obtained with the soluble enzymes. Both immobilized preparations retained 90% of their activity at room temperature for several weeks and could be used repeatedly, while the soluble enzymes lost all activity after several hours under similar conditions of storage. At 4°C the immobilized enzymes retained full activity for 6 months, with the soluble preparations showing a 50% loss. References 4: 3 Russian, 1 Western.
[1798-12172]

UDC 577.152.1

EFFECT OF PHOSPHATIDYLGLYCERIN ON CYTOCHROME P-450 IN LIPOSOMES FROM
DIMYRISTOYLPHOSPHATIDYLCHOLINE

Moscow BIOKHIMIYA in Russian Vol 50, No 1, Jan 85
(manuscript received 8 May 84) pp 97-101

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Bioorganic Chemistry, BSSR Academy of Sciences, Minsk

[Abstract] Kinetics of incorporation of terminal oxidase of a multi-enzymic system, cytochrome P-450 in liposomes from dimyristoylphosphatidylcholine in the presence and in the absence of a negatively-charged phospholipid,

phosphatidylglycerin (PG), was studied with the aid of spin-labelled fatty acids. The effectiveness of incorporation of cytochrome P-450 depended on the PG level in the liposomes with a maximum value in the presence of 10 mole percent of the negatively-charged lipid. Addition of PG increased the protein level in the proteoliposomes and intensified the rate of their formation above and below the temperature of phase transition of the liposomes. It is assumed that the process of cytochrome P-450 containing proteoliposomes depends on both the PG level in the mixture and the phase state of liposomes used for protein incorporation. Figures 3; references 26: 4 Russian, 22 Western.
[1794-2791]

UDC 577.152.1

REGULATION OF CATALYTIC ACTIVITY OF PEROXIDASE IN MIXED REVERSED MICELLES OF SURFACTANTS

Moscow BIOKHIMIYA in Russian Vol 50, No 1, Jan 85
(manuscript received 11 May 84) pp 102-108

YEREMIN, A. N. and METELITSA, D. I., Institute of Bioorganic Chemistry, BSSR Academy of Sciences, Minsk

[Abstract] Effect of the composition of reversed micelles and of additives to a surfactant-water-peroxidase-heptane system on catalytic activity of horseradish peroxidase in the oxidation reaction of o-phenylenediamine (o-PDA) was studied and discussed. Peroxidase oxidation of o-PDA in mixed reversed micelles of various composition did not decrease catalytic activity of the peroxidase. Change of composition of the reversed micelles increased peroxidase catalytic activity 4-fold while retaining other parameters of the reaction. Addition of DMSO, dioxane, isopropyl alcohol, brij 30, tween 61 and triton X-45 to the micellar systems increased peroxidase activity and greatly increased the solubilization capacity of the reversed micelles and their stability. If optimum concentrations of additives were exceeded, the rate of peroxidase oxidation in micelles of surfactants in heptane decreased. Use of nonionic surfactants and low molecular weight additives made it possible to regulate catalytic activity of horseradish peroxidase in organic media and to intensify the solubilizing capacity of the micelles. Figures 8; references 12: 7 Russian, 5 Western.
[1794-2791]

UDC 577.33

INTERACTION OF FERRICYTOCHROME c AND BACTERIAL LUCIFERASE

Moscow BIOKHIMIYA in Russian Vol 50, No 1, Jan 85
(manuscript received 28 May 84) pp 122-127

BOKSHA, I. S., DANILOV, V. S. and YEGOROV, N. S., Biology Faculty, State University imeni M. V. Lomonosov

[Abstract] The mechanism of effect of cytochrome c on activity of bacterial luciferase from luminescent bacteria *Beneckea harveyi* is described and discussed. Inhibition of the bacterial luminescence system of *Beneckea harveyi* by ferricytochrome c was caused by the presence of NADH:cytochrome c-reductase activity in the system. The direct effect of cytochrome c on bacterial luciferase is described and discussed. Presence of an electron transfer shunt at the level of the structural component of luciferase, luminoredoxine, is assumed. Figures 4; references 21: 7 Russian, 14 Western. [1794-2791]

UDC 577.154

UREASE FROM STAPHYLOCOCCUS SAPROPHYTICUS. SOME PROPERTIES AND INHIBITION BY METAL IONS

Moscow BIOKHIMIYA in Russian Vol 49, No 12, Dec 84
(manuscript received 16 May 84) pp 2045-2049

GLEMZHA, A. A., KOVZAN, V. B., and YUODVAL'KITE, D. Yu., Scientific Industrial Association "Ferment" Vil'nyus

[Abstract] Demand for urease has increased. It may be used to determine urea in biological fluids, in chemical plant effluents and municipal sewage systems. Efficient use of urease in analytical systems requires a knowledge of some of its properties. In view of this, data concerning the molecular weight, the dependence of the enzymic rate on the pH and the concentration of the substrate and the effect of metal ions on urease activity are presented and discussed. Precipitation with ethanol was used to isolate a urease preparation with a specific activity of 250-300 units/mg of protein from *Staphylococcus saprophyticus* cells. The molecular weight of the enzyme, determined by gel filtration on a Sephadex G-200 column is 250,000. Maximum activity of *St. saprophyticus* urease occurred at pH 6.8-7.0; the K_m value, at 30°C (pH 6.8) equalled $7.36 \cdot 10^{-3}$ M, V_{max} is $1.5 \mu\text{mol NH}_3/\text{min}$. The enzyme was reversibly inhibited by heavy metal ions. The sequence of inhibiting effect of the ions studied is: $\text{Ag}^+ > \text{Ni}^{2+} > \text{Cd}^{2+} > \text{Co}^{2+} > \text{Hg}^{2+} > \text{Cu}^{2+} > \text{Zn}^{2+} > \text{Pb}^{2+}$ and pK of groups of the active center equal 5.0-5.25 and 8.25 and are near in value to those of the imidazole ring of histidine (0.5-7.0) and the Sh-group of cysteine (8.3-8.6). Figures 4; references 19: 6 Russian, 13 Western. [1793-2791]

UDC 577.150.7-577.154.31

ACTIVITY AND STABILITY OF IMMOBILIZED GLUCOAMYLASE

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 57, No 1, Jan-Feb 85
(manuscript received 5 Jul 84) pp 31-36

IVANOVA, L. A., RAKHIMOV, M. M., YEL'CHITS, S. V., RUZIYEVA, D. M. and
SANDUL, G. V., Kiev Technologic Institute of the Food Industry

[Abstract] Comparative studies were conducted on the activity and stability of immobilized glucoamylase preparations in relation to the manner of immobilization and carrier. The comparative data showed that covalent linkage to adsorbents assured much higher catalytic activities than simple adsorption, as well as longer lifetimes of the preparations. In terms of activity the various adsorbents ranked as follows; aminosilochrome C-80 > AE-cellulose > aminosilicagel ASK > aminosilicagel KSK > aluminum aminoxide > polyamide > aminobasalt fibers. The most effective chemical agent for immobilization of glucoamylase in terms of retention of catalytic activity was gossypol, followed by, in order of decreasing activity, glutaraldehyde, cyanurochloride, and 2,4-toluylenediisocyanate. Figures 1; references 16: 12 Russian, 4 Western.

[1813-12172]

UDC 577.151.04

EFFECTS OF FREEZING AND THAWING ON STRUCTURE AND FUNCTION OF CYTOCHROME OXIDASE

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 57, No 1, Jan-Feb 85
(manuscript received 6 Jan 83) pp 61-64

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Problems of Cryobiology and Cryomedicine, UkSSR Academy of Sciences, Moscow

[Abstract] The effects of various buffer systems and of NaCl and KCl on the structure and function of bovine heart cytochrome oxidase, subjected to freezing and thawing, were studied as part of an effort at better understanding of cryopreservation of vital organs. Cryopreservation was achieved at a rate of 100°C/min, with thawing conducted in a water bath at 15°C. When freezing and thawing was conducted in 0.1 M Na or K phosphate buffer there was virtually no change in cytochrome oxidase activity. However, in 0.1 M tris-HCl buffer 32% of the activity was lost. Addition of 0.34 to 1.87 M NaCl or KCl resulted in the loss of 90 to 25% of the activity. Spectrophotometric analysis in the Soret band indicated that salt addition resulted in conformational changes involving the heme moiety of cytochrome a₃. Apparently, such conformation changes were responsible for the loss of enzymatic activity. Figures 2; references 12: 3 Russian, 9 Western.

[1813-12172]

UDC 577.185.54

ALLOSTERIC MECHANISM OF REGULATION OF ACTIVITY OF LUCIFERASE FROM LUCIOLA
MINGRELICA FIREFLIES

Moscow BIOKHIMIYA in Russian Vol 49, No 12, Dec 84
(manuscript received 16 Feb 84) pp 1965-1971

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imeni M. V. Lomonosov

[Abstract] Experimental data which confirm the allosteric mechanism of regulation of catalytic activity of luciferase by its substrate, ATP and ATP analogs, by mixed anhydrides of mesitylene carbonic acid with AMP, ADP and ATP (AMP-Mc, ADP-Mc, ATP-Mc) are presented and discussed. Existence of allosteric centers for binding ATP in luciferase of the fireflies was demonstrated by analysis of the initial rate of luciferase reaction (v_0) to the ATP concentration and on the basis of data concerning the effect on the stability and activity of the enzyme of mixed anhydrides of mesitylene carbonic acid and AMP, ADP and ATP (AMP-Mc, ADP-Mc, ATP-Mc). Low concentrations of ATP were accompanied by an S-form dependence of v_0 on ATP concentration and enzyme activation by addition of small quantities (1-100 mM) of ADP-Mc. ATP-Mc did not effect stability of luciferase; low concentrations of AMP-Mc stabilized the enzyme and ADP-Mc not only stabilized the enzyme but also caused conformational transition in it, increasing luciferase activity after incubation with ADP-Mc. A kinetic model of the allosteric mechanism of luciferase activity regulation in the presence of saturating concentrations of luciferin and magnesium ions is proposed. This model indicates that luciferase has 2 allosteric centers and 1 substrate center for ATP binding. The affinity of ATP for allosteric centers is approximately 10^3 -fold higher than that for the substrate center; binding of 1 ATP molecule with an allosteric center increases the affinity of ATP for the substrate center. Figures 4; references 9: 8 Russian, 1 Western.
[1793-2791]

UDC 577.12

NONHEME IRON IN BACTERIAL LUCIFERASE REACTION

Moscow BIOKHIMIYA in Russian Vol 50, No 2, Feb 85
(manuscript received 28 May 84) pp 264-269

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University imeni M. V. Lomonosov

[Abstract] Spectrophotometric studies were conducted on the activities of luciferases extracted from Photobacterium (Vibrio) fischeri and Beneckea (Vibrio) harveyi to assess the iron binding agent o-phenanthroline. The

latter was demonstrated to an effective inhibitor as a result of binding nonheme iron, with effective inhibition constants of 1.51×10^{-6} M for *P. fischeri* luciferase and 3.16×10^{-5} M for the *B. harveyi* enzyme. These observations indicate that both enzymes contain nonheme iron, and that the loss of activity is due to the formation of $\text{Fe}^{+2}(\text{OP})_3$ complexes. The fact that such a colored complex is not formed in a system lacking the reducing agents NAD(P)H or sodium dithionate, indicates that the iron in the enzyme, or at least most of it, exists in the oxidized form. Addition of FMN to the reaction mixture accelerates the rate and yield of $\text{Fe}^{+2}(\text{OP})_3$ formation, suggesting that the nonheme iron is located in the electron transfer chain at a site other than the binding site for FMN. Figures 5; references 17;

4 Russian, 13 Western.

[1801-12172]

BIONICS

ELECTROMAGNETIC COMMUNICATION IN FISH

Moscow SOVETSKAYA ROSSIYA in Russian 20 Mar 85 p 4

[Article by M. Makeychik]

[Text] "Can we talk?"

"About what?"

A family scene in which the parties were trying to explain their attitudes was unfolding before our eyes. The dialogue would have been ordinary, on the whole, if it were not for the fact that it was taking place between two albino fish in an aquarium.

Automatic devices for translating the language of fish told all of this. These devices are special instruments which measure the intensity of electromagnetic pulses. Of course, the translation could be understood only by Boris Mikhaylovich Basov, deputy head of the laboratory on problems of orientation of fish at the USSR Academy of Sciences' Institute of Evolutionary Morphology and Ecology of Animals imeni Severtsov.

"Fish communicate in a very original way," Basov interjected in the course of the recording. "They employ a large assortment of means, including audio-visual and chemical ones. Our albinos are 'fond' of electromagnetic pulses."

This experiment has lasted for half a year, and the scientists already can draw preliminary conclusions. In particular, they have established that an electric field arises around 'non-electric' fish as well as rays, for example. This field itself appears as a result of the function of special receptors in the skin tissues of the fish. Moreover, these water creatures are able to transmit the generated charges to each other, for example, when they fall upon their prey, overcome obstacles, or care for their young. The albinos in the aquarium have demonstrated precisely this.

The ichthyologists still have quite a few mysteries to solve, on the whole, but it is already clear that the expression 'dumb as a fish' is out of date.

FTD/SNAP

CSO: 1840/303

DISCOVERY REGARDING VISUAL NEURON ADAPTATION APPLICABLE TO ROBOT USE

Ashkhabad TURKMENSKAYA ISKRA in Russian 3 Apr 85 p 3

[Article by Korepanov, S., correspondent (Moscow)]

[Text] Scientists of the USSR Academy of Sciences' Institute of Higher Nervous Activity and Neurophysiology have discovered a mechanism of adaptation by organs of vision to changes in the brightness of light.

Professor I. Shevelev, head of a laboratory of the institute, said:
"Studies of the reaction of the visual center of the cerebral cortex have shown that neurons in it are arranged in different ways: some, which we call classic neurons, have a fairly stable spatial orientation, while that of others is variable. It was found that vision 'operates' chiefly on the basis of classic neurons in all conditions of illumination. Neurons of the second type are activated during sharp fluctuations of illumination. These neurons momentarily assume the orientation of the classic ones, thus serving as a kind of back-up for the primary system of the brain's visual center."

Results of these studies will aid medical specialists in their practical work, as well as developers of image-recognition systems for new-generation robots.

FTD/SNAP

CSO: 1840/1832

BIOPHYSICS

UDC 543.422.25:577.352.336

¹H-NMR STUDIES ON LYMPHOCYTE MEMBRANES IN HUMAN LYMPHOPROLIFERATIVE DISEASES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 2, Feb 85
(manuscript received 26 Jul 84) pp 170-175

YUSHMANOV, V. Ye., KURUSHIN, Ye. A., KOGARKO, I. N., SIBEL'DINA, L. A.,
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[Abstract] ¹H-NMR high resolution studies were conducted on lymphocytes derived from normal control subjects and from patients with lymphoblastic leukemia, lymphoma, paroxysmal renal hemoglobinuria, and myocarditis, to assess the suitability of this technology for differential diagnosis. The spectra of the plasma membranes obtained at 250 and 360 MHz indicated that the lipid components possessed relatively high mobility. The spectral features of the control and leukemic lymphocytes were nonoverlapping, based on comparison of signal intensities and spin-lattice relaxation times of methyl and methylene fatty acid protons and the methyl protons of the polar phosphatidylcholine heads. The data were interpreted to indicate that the differences were due either to a change in the content of various phospholipids in the lymphoproliferative cells, or to altered protein-lipid interactions. It appears, therefore, that high resolution NMR may be useful in analysis of transformed lymphocytes and, by extension, in the differential diagnosis of lymphoproliferative disorders. Figures 3; references 14: 4 Russian, 11 Western.
[1774-12172]

UDC 577.352.2:577.175.722

ASSESSMENT OF LIPOSOMAL INSULIN STABILITY BY QUASIELASTIC LIGHT SCATTERING

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 2, Feb 85
(manuscript received 29 May 84; in final form 21 Aug 84) pp 176-180

BALABONOV, S. M., DOBYCHIN, P. D., DOLGINOVA, Ye. A., MOSHKOVSKIY, Yu. Sh., NOSKIN, V. A. and ROSSEL'S, A. N., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences; Scientific Research Institute for the Biological Testing of Chemicals, Kupavna, Moscow Oblast

[Abstract] Quasielastic light scattering (633 nm laser, 90° angle) was employed in an analysis of the stability of liposomes in relation to their composition and loading with insulin. The stability of such preparations was found to be strongly dependent on insulin incorporation. Vesicles lacking insulin were least stable, while those charged with insulin remained stable for ca. 100 days. Increasing the lipid content from 10 to 30 mg/ml (lecithin:cholesterol ratio 7:3) also favored improved stability of the suspensions. Liposomal rigidity and stability were apparently improved in the presence of insulin by the binding of insulin to the bilayer lipid membrane and, possibly, resultant changes in inter-particle (interliposomal) interactions. Figures 3; references 15: 7 Russian, 8 Western.
[1774-12172]

UDC 576.8.093.7-073.584

FLUORESCENCE OF HEMOPROTEINS IN REVERSED MICELLES OF SURFACTANTS IN OCTANE

Moscow BIOKHTIMIYA in Russian Vol 49, No 12, Dec 84
(manuscript received 22 Dec 83) pp 1947-1954

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[Abstract] Systematic study of tryptophan fluorescence of cytochrome b₅, myoglobin and cytochrome c in micelles of aerosol OT in octane was described and discussed. Myoglobin from cachalot heart, cytochrome c from horse heart and cytochrome b₅ from rabbit liver microsomes were used. Reversed micelles were produced by use of a sodium salt of a di-(2-ethyl)-hexyl ether of sulfosuccinic acid (AOT). Fluorescence spectra were recorded spectrofluorometrically. Fluorescence intensity of the hemoproteins in AOT micelles, determined by the moisture content of the micelles, was maximum at H₂O/AOT ratios of 2, 3-4 and 5 for myoglobin, cytochrome c and cytochrome b respectively. Fluorescence intensity of the proteins first decreased with the increase of volume of the polar phase but then reached a specific value which is always higher than the fluorescence intensity of the hemoproteins in an aqueous solution. Fluorescence intensity was minimal at H₂O/AOT ratios equal to 6 for myoglobin and 8 for cytochrome c and

cytochrome b_5 . The relationship of fluorescence intensity to the volume of the polar phase at high values of the H_2O/AOT ratio differed for cytochrome c from that for myoglobin and cytochrome b_5 ; after reaching a minimum, cytochrome c fluorescence gradually increased with increase of water in the sample. Maximum fluorescence intensity of myoglobin in AOT micelles was reached very quickly and then remained at this level or increased even further. At large volumes of the polar phase, myoglobin fluorescence in micelles of AOT reached a constant value quickly; maximum intensity was reached more slowly with decrease of the H_2O/AOT ratio. Changes of the proteins after their solubilization by reversed micelles of surfactants in non-polar media were discussed. Figures 5; references 24: 13 Russian, 11 Western, [1793-2791]

BIOTECHNOLOGY

UDC 577.152.321

COMPOSITION OF CELLULASE COMPLEX OF CLOSTRIDIUM THERMOCELLUM

Moscow BIOKHIMIYA in Russian Vol 50, No 1, Jan 85
(manuscript received 22 May 84) pp 109-113

GOLOVCHENKO, N. P., CHUVIL'SKAYA, N. A. and AKIMENKO, V. K., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] It is thought that the anaerobic thermophilic cellulolytic bacterium *C. thermocellum* has the potential for direct industrial bioconversion of cellulose into ethanol. Therefore, much attention has been given to the study of the cellulolytic properties of the culture and to the characteristics of the cellulose complex, which is still not completely understood. Hence, the activity and location of various cellulolytic enzymes of *C. thermocellum* were determined. *C. thermocellum* has 6 known cellulolytic enzymes. Endoglucanase, cellobiohydrolase and exoglucosidase are extracellular enzymes (99-100 percent of the activity is located outside the cells) while cellulobiase, cellobiose phosphorylase and cellodextrine phosphorylase are inside the cells (80-90 percent of the activity).
References 25: 3 Russian, 22 Western.
[1794-2791]

UDC 615.285.7.036.8:[576.895.775.095.38.579.843.95

EFFECTS OF JUVENILE HORMONE SIMULANT ON FLEA VECTORS OF PLAGUE BACILLI

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan-Feb 85 (manuscript received 4 Jan 84) pp 32-36

YERSHOVA, L. S., SERZHANOV, O. S., TKACHENKO, A. F., ZOLOTOVA, S. I., MASLENNIKOVA, Z. P. and KOGERMAN, A. P., Central Asian Scientific Research Antiplague Institute, Alma-Ata; Institute of Chemistry, Estonian SSR Academy of Sciences, Tallin

[Abstract] A series of studies were conducted to determine the susceptibility of flea vectors of the plague bacillus to p-chlorophenol derivative of

geraniol (PCG), a simulant of juvenile hormone activity, to assess its potential role in flea control. Addition of 2.50×10^{-4} ml PCG per gram of sand resulted in 100% mortality of the preimaginal stage of the fleas. A 10-fold reduction in the dose resulted in 1.3 to 62.2% development of mature fleas, depending on the species. In terms of susceptibility to the adverse effects of PCG, the fleas tested ranked as follows: *Xenopsylla skrjabini* > *X. conformis* > *X. cheopsis*. Maximum death rates occurred during metamorphosis; the data indicate that this preparation has potential usefulness in the control of *Xenopsylla*. References 17: 7 Russian, 10 Western.
[1796-12172]

UDC 615.37.012.6(088,8):008

STRUCTURAL ANALYSIS IN PATENT SEARCH OF BIOTECHNOLOGICAL LITERATURE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 85 (manuscript received 14 Mar 84) pp 3-8

SMIRNOVA, G. A., BONDARENKO, N. G. and BELAYA, Yu. A., All-Union Scientific Research Institute of State Patent Expertise, Moscow

[Abstract] In view of the vast volume of literature in biotechnology and the complexity of the subject, patent search in this field has become extremely difficult. This is further complicated by the fact that, in general, patent literature in biotechnology lacks illustrations or other figurative material (with the exception of some patents pertaining to fermenters and various reaction vessels). Consequently, a systemic approach to such literature is a prerequisite for an efficient search and analysis, with a matrix approach offering particular advantages. A sample of a matrix approach to analysis of nutrient media literature is provided, which clearly delineates the source of the media and its components (i.e., plants, organic compounds) in one column, and the carbon and nitrogen sources, for example, in another. Intersection of both factors lead to the patent(s) of interest. References 3 (Russian).
[1797-12172]

UDC 614.7:34

CURRENT STATUS AND PROSPECTS IN LEGAL PROTECTION FOR BIOLOGICAL OBJECTS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 85 (manuscript received 28 Feb 84) pp 8-14

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[Abstract] One of the primary difficulties in affording legal protection for discoveries dealing with microorganisms lies in the definition of the term designated by the word "microorganism" since, in distinction to such a term as "vertebrate", it does not have an indisputable taxonomic meaning. Any microscopic organism can be a microorganism by definition. Since the properties and characteristics of a microorganism are highly dependent on its environment and nutrient media, a given microorganism may have legal protection as a biological object under one set of conditions and not under another. However, despite variability, at the present time almost any microorganism can receive legal protection on the basis of its desired end function or product. A list is provided of the type of microbial and somatic cell collections in the USSR that enjoy patent protection, with the recognition that such protection has not yet been extended to deposited cultures of nonpathogenic protists and algae. References 13: 12 Russian, 1 Western.
[1797-12172]

ECOLOGY

UDC 576.895.7.01(470.311-25)"1951-1983"

CHANGES IN ARTHROPOD POPULATION ENCOUNTERED IN MOSCOW RESIDENTIAL AND WORKING PREMISES IN 1951-1983

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
No 1, Jan-Feb 85 (manuscript received 10 Oct 83) pp 49-54

NIYAZOVA, M. V., SMIRNOVA, A. S. (deceased), KAPANADZE, E. I.,
FEDDER, M. L., RYK-BOGDANIKO, M. G., TETEROVSKAYA, M. O., SMETLEVA, A. G.
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[Abstract] A long-term (1951-1983) analysis was made of the arthropods encountered in living and working premises in the city of Moscow, which resulted in the identification of more than 80 commonly encountered species. The species identified fell into 68 genera, 52 families, 19 orders and 4 classes. In that period of observation there was a constant growth in the diversity and number of species, with the identification of such species as *Nauphoeta cinerea*, *Supella supellictilium*, *Hypoconera eduardii* and *Lasius alienus*, which are rare in the urban environment. In addition to the medically important species (flies, fleas, cockroaches, etc.), an increasing number of arthropods capable of material damage has also been noted (skin beetles, death-watches, long-horned beetles, etc.). These findings point to the importance that "urban entomology" has acquired in recent years, and the need for greater control measures directed against both the medically important and ancillary arthropods. References 14: 1 Polish, 11 Russian, 1 Western.
[1796-12172]

UDC 616.98:579.843.94].036.21-022.39(470.63)

RISE IN EPIZOOTIC ACTIVITY OF NATURAL FOCI OF
STEPPE TYPE TULAREMIA IN STAVROPOL' KRAY AND EPIDEMIC
CONSEQUENCESMoscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in
Russian No 2, Feb 85 pp 88-92

[Article by A. A. Nekrasov, V. G. Pilipenko, V. S. Mel'nikov, A. N. Likhonos, V. A. Popov, M. P. Tarasov, Scientific-Research Anti-Plague Institute of the Caucasus and Transcaucasus, Stavropol']

[Text] The etiological agent of tularemia in the Stavropol' Kray was first isolated from rats in May 1938. The first two cases of tularemia in humans were recorded in December of the same year. The natural breeding ground of tularemia identified at that time in the Northern Caucasus was found to be of the steppe type. Prior to 1981 there were four waves of increased fall-winter epizootic activity of this breeding ground. All of them were accompanied by epidemic complications of varying degree and were repeated at approximately ten-year intervals: 1940 - 1942, 1952-1953, 1961-1962, 1972-1974 [1,4,-6].

The epizootic activity of this breeding ground increased in a background of a large house mouse population which moved to sheltered habitats as the temperature cooled. The house mice were frequent sources of human tularemia infection. During the period of 1940-1942 more than 9,000 cases of human tularemia were recorded, and during 1952-1953 there were 107 cases. One should note that by 1953 a large proportion of the population was inoculated against tularemia with a live tularemia vaccine whereas no such vaccine was available in the 1940-42 period. The unfavorable conditions in those years which hindered the timely and qualitative harvesting of cereal crops contributed to the development of major epizootic outbreaks and epidemiological complications. In 1961-1962 132 persons contracted tularemia, but there were practically no cases of human tularemia during 1972-1974. The lowered epidemicity of the breeding ground is associated with the significant increase in preventive vaccination of the public in the kray and the improved land cultivation methods.

A fifth wave of fall-winter increased epizootic activity of the tularemia breeding ground in the Stavropol' Kray took place in 1981-1982. The population of small mouse-like rodents along the entire plains and foothill region of the Stavropol' Kray was very high in the fall of 1981. The number of trapped animals in open biotopes in individual regions of the kray ranged from 17 to 53.4 percent. The ordinary field mouse was observed to have the highest population density. By the fall of 1981 their population in the kray as a whole increased by 16 times in comparison to the fall 1980, and by 45 times in some sectors. An exception to this situation were the

house mice whose numbers were relatively low both in the open biotopes and in the sheltered habitats. In spite of the prolonged warm fall of 1981, the breeding cycle of small rodents was completely over at the end of October and the beginning of November. With the end of that cycle there was a noticeable drop in the total rodent population. However, because of the warm fall and winter, the rodent population did not significantly decrease as it usually does during this season.

It therefore follows from the above that the fifth wave of increased epizootic activity in 1981-82 occurred in a background of a large common field mouse population and a comparatively small population of house mice. This differs significantly in the epidemiological sense from the previous four outbreaks.

For all of 1981 and the first half of 1982, 117 strains of *Francisella tularensis* were isolated in 14 administrative regions of the kray whereas only 36 strains were identified in the kray for all of the previous five years (1975-1980). The largest number of strains identified in the last epizootic outbreak were isolated from the common and social voles, and house mice. In addition to the indicated species of rodents, the epizootic outbreak also involved small ground squirrels, field mice, white-belly white-toothed shrews, Chinese striped hamsters, grey rats, and hares. Infected fleas and *Ixodoidea* ticks were the carriers of tularemia. One strain was isolated from a rabbit corpse.

In an investigation of suspected predatory birds collected during March and April 1981 in three administrative regions of Stavropol' Kray, positive findings of tularemia antigen in response to antibody neutralization were recorded in 8.4 percent of the cases. In October 1981 suspects were collected in four regions. The average serum positive findings in those cases was 6.6 and did not exceed 10 percent. In April 1982, suspects were collected in five regions of the kray. Sixty-three percent of the suspected animals exhibited tularemia antigen. Over 1,000 suspects with tularemia antigen were collected and examined during the spring of 1982.

The number of identified *F. tularensis* strains, their "geography," and the large number of serum positive suspects attest to the extensive epizootic outbreak of tularemia among rodents that began at the end of 1981.

Cases of human infection were noted in a number of regions of the Stavropol' Kray in the background of this epizootic outbreak. A total of 38 tularemia cases were recorded. One of the reasons that accounts for the relatively low morbidity rate in humans is the extensive vaccination of the rural populace in tularemia prone regions which was followed by revaccination every five years. Thus, 313,500 persons were inoculated in the kray over the last five years (1977-1981). Up to 76 percent of the population was vaccinated in the regions prone to epidemics, and up to 100 percent of the population was vaccinated in the enzootic area of the rural soviet, with the

exception of those persons for whom inoculation was contraindicated. The level of immune coverage is checked annually. The immunity level was checked in 30 populated areas in 1979 where 2,832 persons were given a tularemia skin test which yielded positive results in 2,416 persons (85.9 percent). In 1980, 84.9 percent of 2,722 persons examined reacted positively to the tularemia test, and by the beginning of the diffuse epizootic outbreak in 1981, 88.6 percent of the 2,132 persons examined reacted positively.

The next reason for the low human morbidity is the markedly improved agricultural cultivation methods which eliminate the epidemiologically hazardous late fall threshing period, and others. Perhaps no less important a reason for the low human morbidity rate of tularemia is the comparatively small house mouse population. Fields and populated area grounds in the kray are treated annually against rodents. Thus, 475.7 thousand hectares were treated in 1979, 398.1 thousand hectares in 1980, and 384.3 thousand hectares in 1981 (the data are for epidemic-prone regions of the kray only for 1981). Rat extermination measures covered 17,530,200 sq. meters of populated areas in 1979, 19,849,000 sq. meters in 1980, and 6,531,200 sq. meters in 1981. One should also note the high level of domestic sanitation among the rural population as well as the broad sanitation educational work that is being carried out in the regions of the kray. In 1981 alone, 238 public lectures were delivered that were heard by 7,608 persons. There were 4,295 discussion groups attended by 40,530 persons, 23 radio discussion groups were organized, 16 articles appeared in the newspapers, and 122 sanitation bulletins were issued.

Of the 38 tularemia cases recorded in the kray, there was one case each in six regions and in Stavropol', there were two cases in one region, and group cases of four to twelve persons in four regions. Most of the tularemia cases (28) were rural residents who live at a considerable distance from medical centers (livestock breeding farms, shepherd brigades). Ten cases were urban residents, nine of whom are hunters who were infected while hunting beyond the city limits.

The age breakdown for the tularemia cases was the following: four cases in the 7 - 14 year old group, seven cases in the 15 - 19 year old group, 10 cases in the 20 - 29 group, 4 cases in the 30 - 39 group, 8 in the 40 - 49 group, and 5 cases in the 50 - 59 year old group. Twenty-nine of the cases were men. Farm-associated infections accounted for 62.2 percent of the cases, household infections accounted for 10.5 percent of the cases, and 26.3 percent of the cases were associated with hunting. Infection by ingestion accounted for 16 cases, contact infection accounted for 17 cases, and respiratory infection accounted for five cases. The most characteristic modes of infection included the consumption of food products contaminated by mouse-like rodents, direct contact with rodents, inhalation of dust while working with infected forage, and the drinking of contaminated water. The first case was recorded in December 1981, 28 cases in January, six in February, two in April, and one in August 1982.

F. tularensis infestation of several environmental objects was confirmed bacteriologically. Thus, at a shepherding point in the Kursavskiy Rayon where five persons of the three resident families there became ill, *F. tularensis* strains were isolated from a drinking water well, from a haystack on the dwelling site of the shepherds as well as from house mice which were caught at that site.

The primary source of infection in the case of the hunters were hares. In one case the source was a muskrat, and in another case the source was a fox. Infection occurred by direct contact. In three cases, infection was incurred through finger injuries. In most cases, the meat from the killed hares was consumed. On one occasion we were able to confirm a hunter's infection by isolating the causative bacterial strain from the infection source. Two strains of *F. tularensis* were isolated from the scrapings of two hare hides. According to the hunter who killed the hares they showed no visible signs of disease.

Attempts to isolate a culture from the bubo contents of two patients were unsuccessful.

The most extensive clinical form of the disease was the anginous bubonic form (16 cases). The ulcerobubonic [ulceroglandular ?] form and the bubonic [glandular?] was diagnosed in eight cases, and the pulmonary form was diagnosed in five cases. The oculobubonic [oculoglandular?] form was diagnosed in one hunter who wiped his eyes with dirty hands when skinning the animal. This case is interesting in that the incubation period was not more than 24 hours.

Illness was manifested in light and moderate forms. One case took a severe form. The diagnosis of tularemia was primarily made late so that treatment was not started in a timely manner. In most cases, the patients were diagnosed as having an acute respiratory disease (10 cases), follicular angina (six cases), influenza (2 cases), catarrhal angina (2), conjunctivitis (1), and others.

Only one person of all the patients had been previously vaccinated. He was vaccinated on 22 October 1980 and became ill on 30 December 1981. We were not able to establish the expiration date of the vaccine used. On the 5th to 7th day there was no vaccination reaction. The reaction was slightly positive on the 12th to 15th day. However, we noted from the inoculation record book that there was no reaction to vaccinations in more than one half of the persons inoculated with this series of vaccines. Our region significantly contrasted with the Tula Oblast with respect to number of tularemia patients who had been vaccinated. The tularemia morbidity rate among vaccinated persons in that oblast was 22 percent [2].

We observed complete agreement between tularemia skin test results and agglutination reaction (AR) results in our analysis of allergic and serological reactions in tularemia patients. AR titers most often ranged from 1:100 to 1:400 - 1:800, although we also observed a titer of 1:5120.

There are known cases of crossover AR reactions in patients with tularemia or brucellosis [3,7,8]. We have also identified a brucellosis patient whose blood serum reacted positively in an AR with a brucellosis antigen in a 1:800 titer, and in a 1:200 titer with tularemia.

After the first cases of human tularemia were discovered, the associates at the Scientific-Research Anti-Plague Institute of the Caucasus and Transcaucasus, the kray and rayon sanitation-epidemiological stations, and the medical institutions of the rayons undertook extensive work to eliminate tularemia infections. Emergency prophylaxis measures were taken as required by epidemiological indications. Leaflets were printed, and articles about tularemia were placed in every rayon and kray newspaper. Seminars on tularemia were organized in every central rayon hospital. There were 194 seminars attended by 13,061 medical personnel, 485 briefings which involved 6,839 persons, and 215 lectures were delivered to 10,389 medical workers. A kray extraordinary anti-epidemic commission and the kray department of health sent letters to all of the rayons about the emergent tularemia situation in the kray. Associates of the Anti-Plague Institute and the kray sanitation-epidemiological station checked 12 rayons of the kray which were most threatened by a tularemia outbreak and rendered practical assistance to them. In 1982 750,000 hectares of fields were treated against rodent infestation, and 21,135,000 sq. meters in populated areas were treated. Extensive sanitation-educational work was undertaken which included 594 lectures, 8,390 discussion groups, 83 radio lectures, the publication of 20 newspaper articles, 318 sanitation bulletins, and the issuance of 5,000 leaflets.

During 1982, 152,227 persons in the kray were vaccinated. The planned level of vaccination was 80,000. On the average, up to 90.2 percent of the rural population in the kray has been immunized (1,896 persons were examined).

In consideration of the rather high immunity level of the population in the kray and the relatively small population of house mice in comparison to previous periods of "mouse infestation", one could rule out the probability of massive outbreaks of tularemia among the populace. In fact, there were no cases of tularemia observed in the Stavropol' Kray in the second half of 1982 and the first half of 1983.

In order to avert tularemia outbreaks in the future, it would be advisable to consider the eight to ten year periodicity of the epizootic activity of the disease's natural breeding ground. Primary prophylaxis (vaccination) should be given at appropriate times to all persons for whom such vaccination is not contraindicated, and verification must be made of the vaccination take. Particular attention must be given to livestock breeders, shepherds as well as commercial hare hunters and members of their families.

Conclusions

1. There was a diffuse epizootic outbreak of tularemia among rodents in the Stavropol' Kray in 1981-1982.
2. The fifth wave of the epizootic process significantly differed from the previous four in that there was a large population of ordinary field mice and a comparatively low population of house mice.
3. The principal sources of infection were the mouse-like rodents. Hares were the principal source of infection for hunters. Infection was caused by the consumption of contaminated food products, direct contact with rodents, and the inhalation of dust while working with infected forage.
4. Persons who were not vaccinated for one reason or another became ill. The anginous-bubonic form of tularemia was the dominant form of the disease.
5. A complex of measures was undertaken to identify and eliminate tularemia among the population.

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CSO: 1840/1799

UDC 616.98:579.834.115]-078(470.311)

DIFFERENCES IN SUSCEPTIBILITY OF FIELD MICE IN ALTAY KRAY AND MOSCOW OBLAST
TO LEPTOSPIRA POMONA SEROVAR MOZDOK

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 85 (manuscript received 9 Jan 84) pp 45-49

CHERNUKHA, Yu. G., YEVDOKIMOVA, O. A., ANAN'INA, Yu. V. and CHEKHOVICH, A. V.,
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[Abstract] Field mice captured in the Moscow Oblast and Altay Kray were tested for susceptibility to *Leptospira pomona* serovar Mozdok. Considerable differences in susceptibility of the field mice (*Apodemus agrarius*) became apparent. Adult male and female animals from Altay showed absolute resistance to infection with *L. pomona*, while pregnant females showed the presence of the bacteria in the kidney but not in urine specimens. Among the immature animals the females were 4,5-times as likely to be infected as the males. In addition, the Altay animals developed relatively low antibody titers (1:16-1:40). The Moscow Oblast animals were readily converted to a carrier state and showed antibody titers in the 1:283 to 1:688 range. References 7: 4 Russian, 3 Western.
[1798-12172]

UDC 614.1-07:616.9-036.2(100)(049.32)

EPIDEMIOLOGICAL ASPECTS OF INTERNATIONAL POPULATION MIGRATION

[Review of book by authors CHERKASSKIY, B. L., SERGIYEV, V. P. and LADNYY, I. D., EPIDEMIOLOGICHESKIYE ASPEKTY MEZHDUNARODNOY MIGRATSII NASELENIYA. Moscow, Meditsina, 1984, pp 208]

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 85 pp 108-109

SHLYAKHOV, E. N., Kishinev (reviewer)

[Abstract] This book is described as the most serious Soviet contribution to the problems related to migration and rapid travel from the public health

point of view. In particular, it deals with the danger of importing exotic diseases, such as cholera, African hemorrhagic fever, salmonellosis, and so forth into a number of European countries, including the USSR. Tropical diseases are especially challenging, since physicians unaccustomed to dealing with them might experience difficulties in managing them. Another aspect of the problem pertains to wars, such as the US conflict in Vietnam, and the transfer of disease by troops from one locality or continent to another. Despite its many fine points and detailed epidemiologic analyses, the authors neglected to give adequate coverage to preventive methods. Regret is expressed that the number of printed copies is so small.
[1797-12172]

UDC 616.9-036.21+616.9-084.4]:061.24.053(47+57)"1984"

JOINT PLENUM OF PROBLEM COMMISSIONS ON "ENDEMIC HUMAN INFECTIONS" AND
"SCIENTIFIC BASIS FOR REDUCTION OF INFECTIOUS DISEASE MORBIDITY"

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
No 1, Jan-Feb 85 pp 88-89

KOVALEVSKIY, Yu. V., Moscow

[Abstract] A joint plenum of the commissions on "Endemic Human Infections" [Natural Foci Infections of Man and "Scientific Basis for the Reduction of Infectious Disease Morbidity" was held on February 28-March 1, 1984 in Moscow. The meeting dealt with accomplishments and prospects of endemic infection control in the USSR. It was held at the Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, and was attended by some 150 representatives of Moscow research establishments, as well as those representing similar organizations in 20 other cities and 8 republics. After a general introduction on the first day and discussion of theoretical problems of endemic infections, the second day concentrated on the prevention of specific diseases. L. M. Ivanova emphasized the importance of tick-borne encephalitis and hemorrhagic fever with renal syndrome in endemic pathology in the RSFSR. She covered epidemiologic changes occurring in the past decade, and the immediate need for systematic preventive strategy and tactics in view of the alarming increase in morbidity of the urban population. G. P. Somov, Yu. G. Chernukha, I. V. Tarasevich, and V. M. Saf'yanova reviewed studies done on yersiniosis, tick-borne encephalitis, and endemic rickettsioses and leishmaniases. V. P. Grachev provided a detailed report on the work of a number of research collectives which resulted in the production of a highly effective vaccine against tick-borne encephalitis. The efforts were headed by the Institute of Poliomyelitis and Viral Encephalitides of the USSR Academy of Medical Sciences. In conclusion, the chairmen of the respective commissions, V. D. Belyakov and V. V. Kucheruk, noted that such joint meetings favor coordination of theoretical and practical research.
[1796-12172]

UDC 614.449.57:[576,895.775.095.38:579.843.95

EFFECTIVENESS OF DIFFERENT CONTROL MEASURES IN FLEA ELIMINATION IN AREAS
ENDEMIC FOR PLAGUE: LITERATURE REVIEW

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
No 1, Jan-Feb 85 (manuscript received 23 Jan 84) pp 68-73

SOLDATKIN, I. S., STAROZHITSKAYA, G. S., RUDENCHIK, Yu. V. and
MASTYUKOV, M. L., All-Union Scientific Research Antiplague Institute
"Mikrob", Saratov

[Abstract] A literature review is presented of Soviet efforts in the elimination of fleas in areas endemic for plague, with the admission that this is a delayed development since early efforts at plague control dealt with elimination or control of rodents. Generally, the basic approach consists of disinfecting animal burrows with various insecticides, among which the most prominent are DDT and sevin. However, a more novel and a more recent trend is the impregnation with these chemicals of materials that the rodents use in the construction of their nests. This has the added advantages that actively used burrows are treated. In Central Asia and Southern Siberia approximately 50,000 ha are treated in this manner on an annual basis, and the control of the flea populations appears to be a promising trend in plague control. References 82 (Russian).
[1796-12172]

UDC 578.833.26:[578.286:598.1-167

EXPERIMENTAL STUDIES ON VERTEBRATE-TICK-BORNE ENCEPHALITIS VIRUS
INTERRELATIONSHIP. PART 4. AMPHIBIANS AND REPTILES

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
No 1, Jan-Feb 85 (manuscript received 13 Jun 83) pp 44-46

GUTOVA, V. P., NAUMOV, R. L. and CHUNIKHIN, S. P., Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martynovskiy, USSR Ministry of Health; Institute of Poliomyelitis and Viral Encephalitis, USSR Academy of Medical Sciences, Moscow

[Abstract] Large dose experimental infections with tick-borne encephalitis virus on 2 species of amphibians (*Bufo bufo*, *Rana temporaria*) and 8 reptilian species, to assess the potential of these animals as vectors. Infected amphibians showed persistent viremia for 25 days at 4°C, with serum titers approaching 2-4 log LD₅₀/0.03 units. Increasing the temperature to 25°C reduced the duration of viremia to a week and resulted in the appearance of clinical disease. In the reptilian species viremia persisted for 45 days, with titers of 5-8 log LD₅₀/0.03 units. At 4°C no disease symptomatology was evident in the reptiles, regardless of the dose. At room temperatures and larger doses evidence of frank disease became apparent. Analysis of the data, in conjunction with data on the

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feeding habits of the taiga tick on amphibians and reptiles, suggests that reptiles (especially the lizard *Lacerta agilis*) may be involved in the circulation of the tick-borne encephalitis virus in endemic regions.

References 15: 14 Russian, 1 Western.
[1796-12172]

UDC 576.895.421.06

ATTACK RATE OF IXODES RICINUS LARVAE, NYMPHS AND IMAGOS ON HUMANS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan-Feb 85 (manuscript received 19 Mar 84) p 43

SAVITSKIY, B. P. and TSVIRKO, L. S., Gomel University

[Abstract] A study was made of the attacks of *Ixodes ricinus* on humans in Belorussia in the period 1956-1983, which demonstrated that attacks are most often due to mature females (47.1%) and males (37.2%). Adherence is most often exhibited by females (59.4%) and nymphs (38.1%); however, of the fully engorged individuals 75% were larvae, 29.5% nymphs, and 4.2% adult females. Since half-engorged adult females are noticed more often than the other stages (43.75%), the nymphs and the larvae appear to present a particular danger because of failure of detection.
[1796-12172]

UDC 616.98:579.843.95]-922.39-036.22-07

HYPOTHETICAL ASPECTS OF PLAGUE EPIZOOTIC PROCESSES

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan-Feb 85 (manuscript received 27 Oct 83) pp 36-42

LEVI, M. I., Central Control and Research Laboratory of Disinfection Station, Moscow

[Abstract] Various hypotheses have been advanced to explain the intimate triad consisting of the rodent, the flea, and the plague bacillus and its role in the epizootic process. The triad involved mutual adaptation and interdependence that are predicated on the genetic potential of each member of the triad. Yet, there is no direct evidence for the continuity of the epizootic process in the case of plague, as a result of which a number of hypotheses have been generated to explain the inter-epizootic periods. Basically, such hypotheses fall into three categories which attempt to formulate an explanation based on slow-down in the process, temporary loss of pathogenicity by the plague bacillus, or natural interruptions in the chain of events leading to epizootic states. It is evident that more careful mathematical modeling will have to be employed to account for the inter-epizootic periods, and such models should assist in the planning of more rational experiments. References 57 (Russian).
[1796-12172]

UDC 576.895.7:591.67].01

MANAGEMENT OF VECTOR POPULATION DENSITY: CURRENT STATUS AND PROSPECTS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 85 pp 3-8

ALEKSEYEV, A. N., Institute of Medical Parasitology and Tropical Medicine
imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] The basic purpose of vector population density management is to limit the population to some threshold level at which the human or domestic animal population will not be at risk of infection. In the control of malaria, for example, extensive use has been made of insecticides. However, in the case of malarial and other vectors, resistant forms appear sooner or later. In some cases it is possible to use biological means of control, such as aqueous preparations of *Bacillus thuringiensis* (Sandoz, "Teknar") in the control of gnats. In the case of tick-borne encephalitis in the USSR, perhaps the most important infectious disease in the country, reduction of the vector population to a minimum level has not been possible. To date there is only one paper which states that, in one area (Novgorod Oblast) only, the virus cannot be isolated from a minimum number of ticks, but that still does not indicate that the virus has been eliminated from the territory. Data are available which indicate that after complete extermination of ticks viral circulation resurfaces after the density index of larvae and nymphs on rodents reaches 0.56. It has been demonstrated in the case of gerbils and leishmania that two factors are important in maintaining circulation of the pathogen, the attack threshold and the number of infectious bites. The current trend is to replace insecticides with biological methods of control. These can consist of preparations of sporogenous bacteria such as Vectobac, Bactimos or Teknar, as well as of living predators, the so-called parasitoids. An excellent example of parasites of arthropods are the microsporidia *Nosema algerae* which compete with *Plasmodium* within the body of the mosquito vector. [1796-12172]

UDC 576.895.771:591.67:576.893.192.6].095.18:615.285.7

DDT SUSCEPTIBILITY OF MOSQUITOES INFECTED WITH MALARIA AGENT

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 85 (manuscript received 9 Aug 83) pp 15-17

RASNITSYN, S. P. and ZHAROVA, A. N., Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] The possible effects of invasion by malaria parasites (*Plasmodium gallinaceum*) on the susceptibility of *Aedes aegypti* mosquitoes to DDT was studied in a system involving the exposure of the latter to paper impregnated with 4% DDT for 30-50 min. Analysis of the mortality figures

for the mosquitoes showed that there were no differences between infected and uninfected vectors in the early stages of sporogony and in the stage following its completion. However, during the development of oocysts and sporozoites, the infected mosquitoes showed a relatively low, but statistically significant, increase in susceptibility to DDT. The latter difference was attributed to the physiological consequence of bearing the malarial load, which rendered that category of mosquitoes more sensitive to the effects of DDT. References 14: 2 Russian, 12 Western.
[1796-12172]

UDC 576.895.772.095.1([47+57]-17)

HORSEFLIES IN SOVIET FAR NORTH AND CONDITIONS PREDISPOSING TO ATTACK

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
No 1, Jan-Feb 85 (manuscript received 27 Jan 84) pp 23-28

OLSUF'YEV, N. G. and POLYAKOV, V. A., Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] A survey was conducted on the horseflies prevalent in the Soviet Far North and the climatic conditions predisposing to attack during the period 1963-1981. The study resulted in the identification of 17 species falling into three genera, the Hybomitra, Chrysops, and Haematopota. The species were easily distinguished into tundra species (3) and taiga species (10) as the predominant components with more than half of the species (9) characterized as holarctic. The attack rates were highly influenced by seasonal variations and climatic conditions, and remained rather individualized for each species. In addition to blood-sucking, horseflies appear to have the putative function of serving as vectors for pathogenic agents (*Cl. perfringens*, *Cl. bifermentans*, *Cl. botulinum*). In addition, one of the authors (Polyakov) isolated *Fusobacterium necrophorum* from horseflies, the agent of necrobacteriosis in deer, and demonstrated retention of pathogenicity after 17 days in the fly organism. Finally, horseflies have been demonstrated to transmit anthrax under conditions prevalent in the Far North. References 16: 15 Russian, 1 Western.
[1796-12172]

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FOOD TECHNOLOGY

BRIEF

CULTIVATION OF MUSSELS--Today the attention of many people is riveted to the food resources of the ocean. What is known as marine cultivation is being used more and more widely as a source of raw food materials.... The world's first experimental northern plantations of mussels have been created in the Kandalaksh Gulf of the White Sea. Here, on the Kartesh Promontory, is the White Sea Biological Station of the Academy of Sciences Zoological Institute, where back in the 1960s research on the characteristics of existence of edible mussels began. The work has yielded good results. The substantial value of products from mussels, the high "harvest" of this mollusk, and the small expenses to care for them make marine cultivation of mussels extremely desirable under the conditions of the White Sea. Scientific associates have now developed and are testing a new biotechnology of this marine cultivation, since the conditions of the White Sea require a special organization of the farm as compared to southern plantations, where cultivation of mussels has been going on for a long time. There are three basic methods of raising mussels. One of them--the method of suspended cultivation--is the only one possible for the conditions of the White Sea. The meat of mussels is a delicacy. It is nutritious, it contains many different vitamins and biologically active substances. Dietetic food products made from the meat of this mollusk are preventive measures for various diseases. [By Ye. Usov] [Text] [Leningrad VECHERNIY LENINGRAD in Russian 11 Jan 85 p 2] 12255

IMMUNOLOGY

UDC 615.919:579.841.11].07

PSEUDOMONAS AERUGINOSA TOXOID

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII
in Russian No 2, Feb 85 (manuscript received 28 Dec 83) pp 27-31

YANISHEVSKAYA, M. N., Central Scientific Research Institute of Vaccines and
Sera imeni I. I. Mechnikov, Moscow

[Abstract] In vivo studies were conducted on the immunogenicity and protective effectiveness of *Pseudomonas aeruginosa* toxoid, prepared by treated the exotoxin with 0.4% formalin and 2×10^{-2} M lysine for 7-12 days, and subsequent adsorption of the toxoid on aluminum hydroxide. In addition, trials were also conducted with toxoid preparations supplemented in various proportions with other factors of pathogenicity, such as hemolysin, lecithinase, various proteases, etc. Immunization studies with outbred white mice, guinea pigs, and rabbits demonstrated that the preparations were highly immunogenic in eliciting neutralizing antibodies and protecting the animals from the lethal outcome of infection with *Ps. aeruginosa* bacteria belonging to different O-serogroups. Addition of the other factors (lecithinase, hemolysin, etc.) markedly enhanced the protective effects of the toxoid. Figures 2; references 9: 2 Russian, 7 Western.
[1798-12172]

UDC 615.34-022.7:579.842]-085.37

EFFECTS OF HUMAN IMMUNOGLOBULINS ON MURINE INTESTINAL MICROFLORA IN
DYSBACTERIOSIS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 85 (manuscript received 25 May 84) pp 54-57

GLAD'KO, I. A., KORSHUNOV, V. M. and PINEGIN, B. V., 2nd Moscow Medical
Institute imeni N. I. Pirogov; Institute of Immunology, USSR Ministry of
Health

[Abstract] Studies were conducted on the treatment of CBA mice with
intestinal dysbacteriosis, due to 700 R irradiation or antibiotic

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administration, with normal human immunoglobulins, containing anti-E. coli 014 antibodies in titers of 1:16-1:256. Bacteriological studies on the mucosa of the proximal small intestine showed that the human immunoglobulins protected the mouse intestine from invasion by coliforms. Absorption of the human immunoglobulins with E. coli 014 or with Salmonella minnesota Re595 led to complete or partial loss of the protective effects. These observations suggest that normal sera may be clinically effective on subdermal injection in certain cases of intestinal dysbacteriosis. References 8 (Russian). [1798-12172]

UDC 616.98:579.841.93]-079.4:616.98:579.842.23]-078.731

IN VITRO LEUKOCYTOLYSIS TEST IN DIFFERENTIAL DIAGNOSIS OF BRUCELLOSIS AND YERSINIASIS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 85 (manuscript received 30 Dec 83) pp 92-95

ZHELUDKOV, M. M. and CHERNYSHEVA, M. I., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Direct and indirect in vitro leukocytolysis tests were conducted to assess them for reliability in the differential diagnosis of human brucellosis and yersiniasis. The tests were conducted with protein antigens isolated from Brucella abortus 99 and Yersinia enterocolitica 0-9 as the allergens. The data showed that both tests were highly sensitive and reliable for differentiating the two disease states. The allergic changes are apparently responsible for the appearance of a serum factor responsible for sensitizing leukocytes to the allergens. Comparison with hemagglutination, passive hemagglutination, and Coombs tests showed that the factor(s) responsible for the sensitization of the leukocytes was not an antibody. References 15: 12 Russian, 3 Western, [1798-12172]

UDC 616.98:578.832.1]-07:578.245]-02:615.276.4

EFFECTS OF THYMOSIN ON INTERFERON PRODUCTION AND VIRAL RESISTANCE IN MICE

Moscow VOPROSY VIROSOLOGII in Russian Vol 30, No 1, Jan-Feb 85 (manuscript received 14 Mar 84) pp 64-67

NOSIK, N. N., PARSHINA, O. V., KHROMOV, I. S. and YERSHOV, F. I., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Fractions 5 and 6 of calf thymus thymosin were evaluated for their effects on interferon production in CBA and outbred mice, as well as in an

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in vitro system involving splenocytes derived from the CBA and outbred mice. Both thymosin fractions enhanced interferon production ca. 4-fold in the in vivo experiments, with maximum interferon titers obtained when the interferon inducers (double stranded phage RNA, polyG:polyC, NDV, concanavalin A) were administered intraperitoneally 6-8 h after subcutaneous thymosin administration. A similar enhancement of interferon synthesis was obtained in the in vitro system. Thymosin alone was ineffective in stimulating the production of alpha, beta and gamma interferon. In addition, thymosin also failed to protect the mice from the lethal outcome of infection with the encephalomyocarditis virus of mice. Figures 3; references 5: 3 Russian, 2 Western.
[1806-12172]

UDC 615.371.578.833.26].012

CONCENTRATED AND PURIFIED TICK-BORNE ENCEPHALITIS VIRUS VACCINE PREPARED BY ULTRAFILTRATION AND CHROMATOGRAPHY

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 11 Nov 83) pp 90-93

EL'BERG, L. B., KRASIL'NIKOV, I. V., DROZDOV, S. G., GRACHEV, V. P., PERVIKOV, Yu. V., KRUTYANSKAYA, G. L., KHANINA, M. K., MCHEDLISHVILI, B. M., KOLIKOV, V. M., BRESLER, S. Ye. (deceased) and VOROB'YEVA, M. S., Institute of Poliomyelitis and Viral Encephalitis, USSR Academy of Medical Sciences; State Scientific Research Institute of Standardization and Control of Medical Biological Preparations imeni L. A. Tarasevich, Moscow; Leningrad Polytechnic Institute imeni M. I. Kalinin

[Abstract] A tick-borne encephalitis virus vaccine was prepared by harvesting the virus from monolayer or suspension cultures of chick embryo cells, and subsequent microfiltration and chromatography on macroporous glass. For ultrafiltration 10 μ m thick Laysan films were used with a diameter of 60-80 mm and 3-10% porosity, under a pressure of 0.03-0.05 MPa to give a flow rate of 0.008-0.012 mg/cm². The viral preparation was concentrated 50- to 70-fold, and subsequently chromatographed on macroporous glass with 200 or 400 nm pores and a porosity of 1.5-2 cm³/g. The latter step yielded a further 60-fold concentration with retention of 50-60% of immunologic activity and less than 1% protein admixtures. Immunization of 18-25 year old volunteers with the formalin-inactivated vaccine yielded higher antibody titers as measured by several techniques (neutralization, hemagglutination inhibition, immunodiffusion, blast transformation) than the standard vaccine. Only one of the 20 vaccinated subjects developed a mild subfebrile reaction (37.1-37.2°C). Figures 3; references 6: 5 Russian, 1 Western.
[1806-12172]

UDC 578.245.04:615.31:546.41

STIMULATION OF HUMAN IMMUNE INTERFERON PRODUCTION BY CALCIUM CHLORIDE

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 26 Dec 83) pp 99-102

ORLOVA, T. G., ZHDANOVA, L. V., MESHKOVA, Ye. N. and MENTKEVICH, L. M.,
Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR
Academy of Medical Sciences, Moscow

[Abstract] Human donor blood cells and leukocyte masses were cultured in Eagle's medium and RPMI-1640, and stimulated with phytohemagglutinin or staphylococcal enterotoxin A to produce immune interferon, in order to test the effectiveness of priming with calcium chloride on the process. Within a concentration range of 5 to 20 mM, CaCl_2 stimulated 2- to 4-fold increase in interferon production. The mechanism by which CaCl_2 enhances the production of gamma-interferon remains unclear, although a number of putative mechanisms have been advanced, including alterations in RNA synthesis, calcium permeability, etc. References 11: 3 Russian, 8 Western.
[1806-12172]

UDC 616.98:579.841.11]-078.73

DETECTION OF ANTIBODIES AGAINST PSEUDOMONAS AERUGINOSA FOLLOWING
IMMUNIZATION WITH PYOIMMUNOGEN BY ELISA

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1,
Jan 85 (manuscript received 17 May 84) pp 55-59

SEVERTSOVA, M. K., VAYDA, M. B. and VARRO, R., Central Scientific Research
Institute of Vaccines and Sera imeni I. I. Mechnikov; Moscow; Institute
"Human", Hungary

[Abstract] ELISA methodology was deployed for the identification of antibodies formed in healthy volunteers immunized with a cell-free extract of *Pseudomonas aeruginosa* (pyoimmunogen), to assess the immunogenic potential of the antigenic preparation in question. Analysis of the sera and plasma of unimmunized control subjects showed rather high background levels of antibody, ranging from 1:200 to 1:3200. In the immunized individuals a marked increase in antibody titers was elicited by immunization with pyoimmunogen, underlining the sensitivity of ELISA in the detection of specific antibodies in the presence of high levels of baseline antibody. Furthermore, the system was found suitable for the analysis of both plasma and serum samples with equivalent results, a fact of some importance since either specimen forms may be sent to the clinical laboratory for analysis. Figures 2; references 11: 6 Russian, 5 Western.
[1797-12172]

UDC 616.153.962.4-097-02:663.031.6]-078.73

DETECTION OF ANTIBODIES AGAINST COMMERCIAL FEED YEASTS BY ELISA

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 85 (manuscript received 17 May 84) pp 62-64

KLEYEVA, O. B., PAVLOVA, I. P. and PADALKIN, V. P., Institute of
Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of
Medical Sciences, Moscow

[Abstract] An ELISA method was developed for the detection of antibodies against *Candida* in human sera, and the comparison of ELISA with standard indirect immunofluorescence technique. An analysis of 223 sera obtained from workers at a plant engaged in the production of feed yeast, as well as from residents in a city without such a plant, showed that 70% of the workers were positive for specific antibodies by the ELISA technique. In addition, such individuals also presented with elevated IgM levels in comparison with the control group, but the correlation coefficient between the presence of antibody and high IgM was weak ($r = +0.25$). Of 76 individuals working with food-quality yeasts, three were positive for specific anti-*Candida* antibodies. The study demonstrated that ELISA is a sensitive and convenient method for monitoring exposure to *Candida* antigens, yielding titers 10- to 20-fold higher than those obtained with immunofluorescence. References 4: 2 Russian, 2 Western.

[1797-12172]

UDC 578.833.26+578.824.11].083.3

ELISA IN STUDIES ON TICK-BORNE ENCEPHALITIS AND RABIES

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 85 (manuscript received 17 May 84) pp 73-77

SUBBOTINA, L. S., NAVOLOKIN, O. V., BOTVINKIN, A. D. and MATYUKHINA, L. V.,
Scientific Research Institute of Endemic [Natural-Foci] Infections, Omsk

[Abstract] An assessment was made of the suitability of the ELISA method for the detection of antibodies in human sera of subjects immunized against tick-borne encephalitis or those that had resided in endemic areas, and in mice sera of mice either actively or passively immunized with the tick-borne and rabies vaccines. The data obtained with ELISA were compared with the results of standard serologic techniques (hemagglutination inhibition, complement fixation, virus neutralization). The ELISA method was found to be highly sensitive and specific and, with respect to hemagglutination inhibition, a correlation index of $r = 0.84$ was obtained, with a higher positive rate with ELISA. The differences in the results obtained with hemagglutination inhibition and ELISA are difficult to explain, but may have been due to the fact that the sera contained IgM antibodies not detectable by the use of anti-IgG conjugates. Figures 4; references 11: 5 Russian, 6 Western.

[1797-12172]

UDC 578.832.1+578.833.26]:578.74.083.34

IMMUNOFLUORESCENT MICROMETHOD FOR DETERMINATION OF INFLUENZA AND TICK-BORNE
ENCEPHALITIS ANTIGENS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1,
Jan 85 (manuscript received 12 Mar 84) pp 77-81

VASERIN, Yu. I., ZHUROV, S. A., LEDENTSOVA, R. Yu. and ZLOBIN, V. I.,
Sverdlovsk Scientific Research Institute of Viral Infections, RSFSR Ministry
of Health

[Abstract] Various biological and diagnostic samples were analyzed for the presence of influenza and tick-borne encephalitis antigens by the standard Coombs test, as well as direct and indirect erythrocyte immunofluorescent techniques. The essential features of the direct technique consist of the viral antigen reacting with rabbit antibody conjugated to RBCs, followed by reaction with fluorescent antibody against the virus. In the indirect method the viral antigen reacted with rabbit antiserum against the virus, followed by treatment of the smears with virus-conjugated RBCs, and subsequent treatment with fluorescent antibody against rabbit IgG. The results showed that introduction of the erythrocyte component into the Coombs technique markedly improved the sensitivity and specificity of the technique. However, the direct and indirect erythrocyte methods are more difficult to perform and require greater care and more controls. In the case of influenza diagnosis the indirect method was found to be more sensitive than the direct method. References 6: 4 Russian, 2 Western.
[1797-12172]

UDC 578.891:578.74].083.3

SOVIET REAGENTS IN ELISA METHODOLOGY FOR DETECTION OF HB_eAg IN HUMAN SERA

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 85 (manuscript received 17 May 84) pp 90-93

YEVSEYEVA, L. F. and ASRATYAN, A. A., Institute of Epidemiology and
Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] An ELISA technique was devised for the detection of HB_eAg in human sera, based essentially on the technique described by G. Walters et al. [J. Clin. Path., 29: 873-879, 1976]. Specific anti-HB_eAg antibodies were prepared by dissociation of immune complexes, and a Soviet peroxidase was used for the conjugation with the antibody. Studies on 200 serum samples showed that the ELISA method was highly sensitive and specific, showing a 90% concordance with RIA results. References 9: 4 Russian, 5 Western.
[1797-12172]

UDC 615.373.3:579.841.11].012

GENERATION OF ANTIBODIES AGAINST PSEUDOMONAS AERUGINOSA AND PROTEUS FOR USE
IN ELISA

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 85 (manuscript received 17 May 84) pp 51-55

BULAVA, G. V. and YERMOLIN, G. A., Scientific Research Institute of
Emergency Services [Skoraya Pomoshch] imeni N. V. Sklifosovskiy, Moscow

[Abstract] Rabbits were immunized with cell-free extracts of Pseudomonas aeruginosa and Proteus obtained by repeated freezing and thawing of the bacteria or ultrasonication, in order to generate antibodies suitable for use in ELISA intended for laboratory diagnosis. Application of the ELISA technique to the sera obtained from patients with septicemias resulted in identification of Ps. aeruginosa or Proteus antigenic determinants in 86.4 and 83.4% of the cases, respectively, within the first three days of symptomatology. Subsequently, bacteriologic studies on purulent wound discharge confirmed the presence of the pathogenic agents in question. The advantages of the ELISA technique lie in earlier diagnostic data, since at the time that the ELISA results are available bacteriologic studies were positive in only 52-58% of the cases. Figures 1; references 7: 3 Russian, 4 Western.

[1797-12172]

UDC 576.895.775:591.67];579.843.95].097.3.083.33

SEROLOGIC STUDIES ON FLEAS IMMUNE TO PLAGUE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 85 (manuscript received 14 Jul 83) pp 28-32

KHRUSTSELEVSKAYA, N. M. and STRUCHKOVA, E. N., Chuvash Pedagogic Institute
imeni I. Ya. Yakovlev, Cheboksary; Central Asian Antiplague Institute,
Alma-Ata

[Abstract] A serologic test was devised to study the development of immunity in fleas fed on killed plague bacilli, which demonstrated that the fleas responded with antibody-like immune factor(s). The response followed classical immune response kinetics, showing an initial rise in titer, maximum titers or activity, and a subsequent stage of decline. Re-exposure to the killed bacilli resulted in a response similar to the anamnestic antibody response in mammals. Lysis of the bacteria was accomplished only in the presence of guinea pig complement. In addition, in in vitro studies, the immune factor(s) inhibited colony growth of the plague bacilli. The authors hope that this preliminary report will stimulate other investigators to study the nature of the putative flea "antibody".

References 11 (Russian).

[1796-12172]

LASER EFFECTS

UDC 616.329-006

EFFECT OF HELIUM-NEON LASER RADIATION ON SOME IMMUNOLOGICAL FEATURES OF
LYMPHOCYTES IN VITRO

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 11, Nov 84 pp 51-53

LAPTEVA, R. M., BABISHEVA, S. A. and MAKAROVA, O. I., Laboratory of
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[Abstract] Study of the effect of LG-75 neon-helium laser light on lymphocytes in vitro emphasized examination of the nature of quantitative and qualitative changes of T-lymphocytic populations in a test of E-rosette formation and the blast transformation reaction of lymphocytes in spontaneous and phytohemagglutinin (PHA) induced reaction and included study of peripheral venous blood of 24 clinically healthy blood donors of both sexes, ranging in age from 18-36 years. LG-75 laser radiation at power density of 75 mW/cm² and exposure of 4 minutes definitely increased the E-rosette formation capacity of lymphocytes, by 13.6 percent, on the average. Eight-fold LG-75 irradiation (at the same dose) of leukocytes cultures induced a pronounced increase of transitional forms of blast transformation cells in cultures with PHA mitogen and in mitogen-free cultures, i.e., it greatly increased spontaneous and PHA-induced blast transformation of T-lymphocytes.
References 2 (Russian).
[279-2791]

MARINE MAMMALS

INVESTIGATION OF RATIONAL ACTIVITY IN ANIMALS

Moscow ZNANIYE - SILA in Russian No 1, Jan 85 pp 38-40

[Annotation and excerpts from article by Yu. Leksin, "Once Upon a Time There Were Some Rats"]

[Text] Annotation

The capacity of many animals for rational activity is apparently no longer questioned by most scientists. It is another matter to evaluate such activity and comprehend how it helps animals build their behavior. The late Leonid Viktorovich Krushinskiy, corresponding member of the USSR Academy of Sciences, spent many years on development of methods for such evaluation of rational activity. Our journal repeatedly offered articles about the work of this scientist to readers. Concurrently, in continuation of this work, Natal'ya Leonidovna Krushinskaya, candidate of biological sciences, is pursuing research in the Laboratory of Postnatal Ontogenesis at the Institute of Developmental Biology imeni N. K. Kol'tsov, USSR Academy of Sciences. She states: "With reference to the problem of investigating rational activity of animals, we became interested in two questions: Is this capacity inherited by animals and what role does this form of higher nervous activity play in animals' social life?"

[Excerpts] It all started with dolphins. They lived here in families, and it was terribly interesting to see how they develop relations with their offspring, females, who the leader is and why. But at that time, these were only wishes. It was interesting to think about the individual mental traits animals must have to assume the highest ranks in their community. And is there such a link at all? At present we have a physiological, let us say, rather objective method of assessing animals' rational activity.

We see that, in rats, the dominant is still determined by aggressiveness and strong type of nervous system. At least, this is the primary factor. They may also have a good capacity for solving extrapolation problems. Then again, they may not have it. The hierarchy turned out to be somehow more complicated than it appears at present. We refer not only to competition for limited resources, i.e., females, food, etc. Not everything is so clearcut in the hierarchic structure, in its motives. It was interesting to observe this in dolphins. Leonid Grigor'yevich Voronin had already observed a group of two males and one female. One of the males was the obvious dominant. He depressed the lever

and was given a fish. But there were three levers. However, the other dolphins did not go to those that were available, even though they could have received fish there; rather, they stayed in line and waited for expressly the lever that had been used by the dominant to be free. But he would eat his fill, so that he would never let any other dolphin approach the lever. He continued to depress it himself and fed them, his subordinates. He no longer needed food as much as the opportunity to distribute it at his will.

There has also been somewhat similar behavior in a dominant dolphin which was part of a circus group. He never attacked any of the others during a performance, never pursued any of them, but was merely next to them; however, none of the other dolphins could perform in his presence. Apparently, he would "say" something to them in their "language." But the minute he was removed, all the rest performed very well. This is already some sort of despotism. For, it would seem, what does it matter to him whether they performed together or not? It turns out that it did matter! In other words, everything is much more complicated. Apparently, there is also the simple desire for leadership, some wish to subordinate others. Incidentally, for the time being, to my knowledge what is written pertains mainly to food and females.... But the relations in the animal kingdom are apparently much more complex and interesting than our determination to delve deeper into it.

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CSO: 1840/1788

DIALOGUES WITH DOLPHINS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Mar 85 p 4

[Article by M. Dmitruk]

[Text] There was an unusual concert in the channel between Vancouver Island and the coast of Canada. People with microphones and electric guitars came up on deck and began to sing ... in the total absence of an audience. A rehearsal? Not at all, an audience soon appeared, not on deck, but under water. The concert was specially organized for killer whales.

First their enormous flippers appeared above the water then clicks, whistles and, finally, singing resembling the sound of bagpipes were heard in the earphones that were connected to hydrophones. Each musical phrase played on the vessel evoked singing in water in response, and people and dolphins communicated with one another in this way for several hours (see photo [not reproduced]).

And when one of the researchers dived into the water as a gesture of total trust in the dolphins, he was accompanied by an "honor guard" of killer whales. This incident causes one to question the existing idea about orcas as being terrible killer whales that attack man. Incidentally, the well-known scientist, John Lilly, observed that not a single person had been wounded in his 30 years of work with orcas in dolphin tanks--the "sea monsters" behaved amazingly peacefully.

History records quite a few instances of miraculous rescues of people by dolphins. And the cliff drawings found in Australia, Africa and America indicate that our distant ancestors communicated with dolphins in the open sea. If people would learn to understand the "language" of these animals, it would perhaps be possible to reveal many of the ocean's secrets.

Soviet researchers have discovered many patterns in the "language" of dolphins. They have determined that when communicating with one another the "intellectuals of the sea" make use of several hundred sound signals. Curiously enough, in our ordinary everyday conversations, we use about the same number of words. Specialists became convinced of the wide diversity and complexity of signals; they constructed an analytical picture of the language of dolphins and learned that their communications are structurally organized in about the same way as human speech.

Unfortunately, efforts made by scientists to decode dolphins' language have failed thus far. But if we cannot exchange ideas, why not communicate on the level of our senses? After all, our language is not important to the perception of music. This was what the enthusiasts were thinking when they embarked on their "tour" for the orcas. Their suspicions, it would appear, were not unfounded, the musical dialogues with the dolphins took place daily for one month.

The tape recordings of the joint concerts of humans and dolphins have yet to be decoded by foreign scientists. But the enthusiasts now plan to hold something like synchronous swimming sessions with the orcas.

10,657

CSO: 1840/1808

UDC 599.745.1:591.526

POPULATION STUDY OF NORTHERN FUR SEAL (*CALLORHINUS URSINUS*) BY PHENETIC METHOD

Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol 63, No 11, Nov 84
(manuscript received 17 Oct 83) pp 1705-1712

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[Abstract] Studies of pinniped populations constitute one of the most important aspects of current interest in marine mammals, since they provide a rational basis for the exploitation of this natural resource and the formulation of protective measures for certain species [Tomilin, A. G., et al., in: New Studies on Cetaceans and Pinnipeds (in Russian), Moscow, Nauka, 1978, pp 3-8]. A phenetic study was conducted on certain external features of two populations of the fur seal (*Callorhinus ursinus*, Pinnipedia, Otariidae) on Tyuleniy Island in the Sea of Okhotsk and Commander Islands in Bering Sea. The results showed that on the basis of the differences in the front flipper pattern and neck color patterns the seals from the two island groups constituted different genetic populations, data confirmed by chi-square and frequency differences. It appears that the combination of females into a harem is not a chance process, but based on deeper relationship principles that are retained in the open sea. Figures 5; references 22: 20 Russian, 2 Western. [1807-12172]

MEDICINE

UDC 616.89-008.441.13+616.36-37

INDICATORS OF LIVER FUNCTIONAL STATE IN PATIENTS WITH DELIRIUM TREMENS

Kiev VRACHEBNOYE DELO in Russian No 1, Jan 85
(manuscript received 20 Apr 84) pp 30-32

[Article by N. P. Skakun, R. S. Romas', Yu. S. Shugaley, V. V. Degtyar and N. A. Koval'chuk; Psychiatry Course (Head--Docent R. S. Romas') and Department of Pharmacology (Head--Professor N. P. Skakun) of the Ternopol' Medical Institute]

[Text] Investigation of the liver functional state with chronic alcoholism and acute alcoholic psychoses has attracted the attention of researchers for many years. Literature data on the state of the liver with alcoholic delirium are ambiguous. E. M. Zapol'skiy and coauthors (1976) found profound morphological changes in the liver of patients with alcoholic delirium and pointed out a close relationship between them. I. R. Khasanov (1980) believes that alcoholic delirium is accompanied by increased transaminase activity and reduced cholinesterase activity. V. M. Banshchikov and coauthors (1968), V. F. Matveyev and coauthors (1975), V. Z. Mikhal'skiy (1975) and other researchers have not found any substantial changes in liver enzyme activity and have questioned the soundness of the hypothesis concerning the hepatogenic origin of alcoholic delirium. In turn, V. M. Karlinskiy and coauthors (1975) and other researchers have indicated the potentiality of developing psychosis with diseases of the liver as a result of its functional antitoxic disorder. Most researchers have studied the functional state of the liver at a given moment and not the dynamics of the liver; and, this has given an incomplete picture of the degree of reversibility of the disorders after experiencing psychosis.

We set a goal for ourselves to study the dynamics of some enzymes that characterize the functional state of the liver in alcoholic delirium patients. Twenty six male patients, ages 28-50 years who had been definitely diagnosed as having alcoholic delirium, were studied.

The degree of liver damage was determined by the blood serum activity of alanine aminotransferase (ALT), aspartamine transferase (AST) and alkaline phosphatase (ALP), Cholinesterase (CHE) activity in the blood plasma was also determined. The investigations were con-

ducted during alcoholic delirium, and then 3, 6-8, 13-15 days as well as 20-22 days later. The results were compared with the indicators for 24 healthy males of the same age characteristics.

Table

Indi- cators	In delirium	After delirium				
		3 days	6-8 days	13-15 days	20-22 days	
ALT	1,838± 0,319*	1,466± 0,169**	1,094± 0,230**	0,807± 0,090**	0,621± 0,113..	0,410± 0,018
AST	0,950± 0,131*	0,819± 0,133*	0,750± 0,111**	0,594± 0,055**	0,203± 0,045**	0,401± 0,023
ALP	88,90± 5,88*	76,43± 2,82*	65,00± 5,00**	65,00± 5,00**	66,43± 2,83**	61,82± 5,050
CHE	0,282± 0,014*	0,293± 0,014*	0,341± 0,026**	0,394± 0,016**	0,414± 0,034..	0,452± 0,012

Note: ALT and AST activity is expressed in mmols of pyruvic acid per liter [sic] of serum, incubated for 1 hour at 37°; ALP--in mcmols of 4-nitrophenol, released by 1 liter [sic] of blood serum in 1 minute at 37°; CHE--in mg of acetylcholine broken down by the cholinesterase of 0.1 ml blood plasma in 30 minutes at 37°.

*--marks the indicators of patients that statistically differ reliably from the indicators of healthy patients ($P < 0.005$);

**--indicators of patients that statistically differ reliably from the initial level.

The investigation method: ALT and AST activity was determined according to Reytmayen and Frenkel' (1957), cholinesterase activity according to E. Sh. Matlinova and V. M. Prikhodzhan (1961), and alkaline phosphatase activity according to Bessi and coauthors (1946). The obtained results were subjected to variational-statistical processing according to A. S. Kaminskiy (1964). Those results in which P is less than 0.05 are regarded as reliably different from the compared indicators.

The dynamics of change in the liver functional state indicators of alcoholic delirium patients are presented in the Table.

Data in the table show that at the time of alcoholic delirium all the investigated indicators statistically were reliably different from the indicators of healthy persons. ALT activity was higher by a factor of 4.5, AST by a factor of 2.4, and CHE activity was reduced by a factor of 1.6.

Three days after alcoholic delirium stopped, the activity of ALT, AST and ALP was reduced, but it did not reach the control figures obtained for healthy persons. The reduction of ALT activity (which was 20.2% lower than the initial level) was most marked. Cholinesterase activity during the first three days practically did not

change.

A further reduction of ALT, AST and ALP activity was observed on the 6th-8th days after alcoholic delirium stopped. ALT activity dropped most significantly (on the average by 40.5% from the initial level). AST and ALP activity dropped by 21 and 27% respectively compared to the initial level. Subsequently, ALP activity did not change substantially, and on the average stayed at the level of the indicators for healthy persons.

During the next two-week period, a gradual reduction of ALT activity was found, but even by the 20th-22nd day in approximately two thirds of the patients the activity of this enzyme exceeded the indicators of healthy persons, sometimes by a factor of two or three. The significant reduction of AST activity over the first two weeks became increasingly more marked the third week. As a result, AST serum activity by the end of the third week was twice as low as that of healthy persons.

Cholinesterase activity during delirium tremens, the same as three days after it stopped, was sharply reduced. Subsequently, the activity of this enzyme gradually increased and by the end of the third week did not differ statistically from the level of healthy persons. Thus, the results of our research concur with the data of other authors concerning significant change of liver enzyme activity with alcoholic delirium, however, these results differ from the opinion of some researchers who maintain that AST activity in the blood serum of alcoholic patients rises more significantly than ALT activity.

The presented data indicate a need for conducting intensive, pathogenetically based therapy for patients, including therapy contributing to liver normalization, for a prolonged period of time after alcoholic delirium has occurred, and they confirm the need for conducting more detailed research directed at obtaining more specific information on the liver damage mechanisms with chronic alcoholism and alcoholic psychoses.

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CSO: 1840/1044

UDC 616.24-002.5-07(061.3)(049.3)

CONFERENCE OF PHTHISIOLOGISTS AND PULMONOLOGISTS

Kiev VRACHEBNOYE DELO in Russian No 1, Jan 85, pp 122-124

[Article by N. S. Pilipchuk (Kiev)]

[text] A conference of chief specialists of oblast departments of health, chiefs of tuberculosis and pulmonology departments, and chief physicians of the republic sanatoriums was held in Lutsk on May 30-31, 1984. At the conference, results of the fight against tuberculosis and nonspecific diseases in the UkSSR were discussed as well as development of antituberculosis and pulmonological care for the population of UkSSR.

Professor V. N. Molotkov, director of the Kiev Institute of Tuberculosis, Pulmonology and Thoracic Surgery, opened the conference. He pointed out the successes in the fight against tuberculosis in Volynskaya Oblast and the need for improving dispensary service methods for patients with lung diseases as well as the equipment of pulmonological departments.

The Chief of the oblast Department of Health, P. I. Vitsek, gave the welcoming address to conference participants. He presented data on the growth of industry and the strengthening of agriculture, education and public health in Volynskaya Oblast during the years of Soviet rule.

L. F. Kobyakova in her presentation stressed the sharp reduction (to 9.5%) in fibrocavernous tuberculosis among first-time patients that may be attributed to roentgenofluorographic examinations. However, roentgenofluorographs are not sufficiently used in all oblasts because roentgenofluorographic offices cannot be found everywhere. Functional diagnostics and the distribution of bacteriological laboratories need to be improved. Further, L. F. Kobyakova pointed out the need for improving the quality and increasing the volume of examinations for patients under dispensary conditions, and for transferring treated patients in time to dispensary observation groups with inactive tuberculosis. In 1983, the epidemiological indicators for the fight against tuberculosis continued to improve: morbidity was reduced by 8% and mortality by 14%. Improvement of the epidemiological situation depends on the recovery,

including the use of surgical methods, of 90% of first-time patients. Moreover, the work of identifying tuberculosis patients in time in remote areas is inadequately conducted, and cases of tuberculous meningitis are found.

The establishment of a pulmonological service has definitely been successful. Physicians have been trained for pulmonological offices, and departments with 100 and 200 beds have been set up. This has led to a 10% reduction in temporary work disability. Together with these attainments, there are still unsolved questions. Some pulmonological centers are poorly staffed, insufficient attention is directed to economic efficiency that implementation of scientific achievements could bring, and special training methods need to be improved.

N. D. Pisareva, deputy chief of the resort administration of the UkSSR Ministry of Public Health, reported on the role of sanatorium treatment of tuberculosis patients at the present time. Sanatorium treatment promotes more rapid restoration of work capabilities. The quality of sanatorium work can be improved by fighting delays and eliminating the sending of patients without proof to sanatoriums for treatment. Treating patients in a sanatorium for two to three months is incorrect because a month's stay in most cases is adequate. Patients from the VIIa [?] groups of dispensary observation may also be sent to a tuberculosis sanatorium when accompanying diseases are present. M. V. Tereshchenko and D. I. Chumak, R. K. Kabisova and coauthors, and Yu. I. Yurchenko in their presentations shared their experiences in treating patients at sanatoriums.

The presentation of the Deputy Chief Physician of the republic Sanitary-Epidemiological Station, O. Ye. Shul'gi, was rich in content. He pointed out that antiepidemiological research has been inadequate and, as a consequence, there are no methodical recommendations for the improvement of antiepidemiological measures. It is essential that identification of strains and species of tuberculosis mycobacteria be set up everywhere, disinfection of sewage in some tuberculosis institutions be carefully monitored, more attention be paid to antiepidemic conditions and, particularly, disinfection be implemented and instructions on specific and chemical prophylaxis be strictly carried out.

The real organizational problems of identifying tuberculosis patients were elucidated in the report of V. N. Molotkov and M. S. Dvoyrin. The basic role of roentgenofluorographic examinations and the need for better use of stationary roentgenofluorographs was stressed in a large body of factual material. Roentgenoscopy is used in only 1.9% of the prophylactic examination cases. The need for improving bacteriological diagnostics was also stressed.

O. M. Ivanyuta, V. M. Petrenko and L. V. Turchenko reported on the problems of improving the diagnostic work of antituberculosis institutions. Special attention was given to the role of treatment

under ambulatory conditions as this is most important in the prophylaxis of tuberculosis recidivists.

R. Ya. Manastyrskiy reported on the significant improvement in the epidemiological situation of tuberculosis in the oblasts treated by the L'vov Institute of Tuberculosis. Many more important successes are feasible with effective incorporation of scientific achievements into the practice of tuberculosis institutions, improvement of health propaganda, activation of public commission work, and improvement of the training work quality for personnel.

A. S. Mamolat reported on the role of tuberculosis chemotherapy in improving the epidemiological situation. He stressed that social factors have exerted and will continue to exert influence on the widespread nature of tuberculosis, although these factors change. Exogenous infection is dangerous, but with chemotherapy there is no mass tuberculosis infection.

Patients with destructive forms of tuberculosis and suffering from alcoholism represent a particularly great epidemiological danger. N. S. Pilipchuk, V. P. Mel'nik, V. A. Kalabukha and A. V. Kalabukha reported on ways of improving the efficacy of treating such patients. The reports were basically of a descriptive nature. But, N. S. Pilipchuk and V. P. Mel'nik did cite data on the insufficient concentration of tuberculostatic substances and the expressed changes in the electroencephalograms of patients suffering from alcoholism; and, this has to be taken into account when conducting treatment. In this respect, the report of R. G. Protsyuk was interesting; he presented materials on a detailed study of tuberculostatic substance concentrations in the blood and lungs of tuberculosis patients with different treatment methods, including post ultrasonic inhalations. For the first time, the feasibility of conducting a controlled chemoprophylactic method of aerosol inhalation was proven.

Various aspects of dispensary service rendered by phthisiologists were elucidated in the reports of A. Ya. Ladnyy, L. M. Litvin, N. N. Romanenko, O. L. Dmiterko, N. A. Lysenko, N. I. Vashchenyuk, I. Ya. Gnatyuk, P. M. Tverdokhlevova, S. M. Roslik and coauthors, A. D. Popovskaya and T. S. Kucher, V. G. Borodin and V. V. Khomenko. Specifically, the speakers shared their experience with centralized control of prophylactic medical examinations, and discussed questions regarding temporary and permanent work disability, use of allocated beds, organization of work in roentgenofluorographic centers, and methods of improving early detection of tuberculosis. Questions about tuberculosis prophylaxis, prophylactic medical examinations, organization of departmental work and improvement of early diagnostics were discussed in the reports of V. P. Kostromina and coauthors, B. V. Noreyko and coauthors, N. S. Strakhov and M. I. Strutinskiy, B. M. Pukhlik and B. A. Berezovskiy, A. V. Stargan, S. I. Pashchenko, V. M. Vays and E. P. Shimko, G. A. Kurcherenko and coauthors, V. A. Nichiporuk, and S. A. Kshanovskiy. The reports show that the 60% morbidity of children is the result

of tuberculous foci, and carriers of expressed residual changes represent a disease danger for adults. The disease may be caused by isoniazidresistant myobacteria, and this must be considered in conducting chemoprophylactic and tuberculostatic therapy. Among persons from whom the bacteria are isolated, 30% of these people suffer from chronic alcoholism, and this increases the epidemiological danger, particularly in rural conditions. The household methods of FAP [expansion unknown] colleagues contribute to the detection of tuberculosis in time. Patients are examined in detail in a polyclinic when symptoms of lung disease are detected. This helps to control the large number of roentgenofluorographic examinations.

Questions concerning the organization of pulmonological care (B. M. Brusilovskiy and coauthors, T. A. Starozhinskaya and coauthors, and Zh. Ya. Kolesnikova and coauthors) were discussed at the conference, and the work of thoracic departments of UkSSR antituberculosis institutions (I. M. Slepukha) were analyzed. S. V. Khramov and coauthors, L. V. Yudina and coauthors, V. P. Geychenko, and L. I. Mikolishina reported on the prophylaxis and treatment of nonspecific lung diseases. A. Ya. Ladnyy and A. G. Geynak gave an interesting report on the diagnostics of spherical formations in the lungs, and V. Z. Vaynshtok's presentation was devoted to the real problems of training physician-therapists in pulmonology.

At the conference, the Chairman of the Board of the republic Scientific-Medical Association of Phthisiologists, A. S. Mamolat, and L. V. Chechel' of the pulmonologist section presented a report, and V. K. Pekura presented a report on "Implementation Results for the All Union and Republic Plan of Introducing Scientific Achievements in 1983 and the Goals for 1984-1985". Professor A. S. Mamolat, president of the phthisiologist association, called for the establishment of pulmonologist sections everywhere, improvement of ideological-educational work among association members, preparation for a befitting celebration of the fortieth anniversary since the Victory over Germany in the Fatherland War 1941-1945, expansion of knowledge on pulmonology among phthisiologists, assistance to practical health care phthisiologists in carrying out scientific studies, activation of propaganda on hygiene, and fighting against smoking and alcoholism.

At the plenum, R. Ya. Manastyrskiy, director of the L'vov Scientific-Technical Institute, was elected as member of the board and member of the presidium board of the UkSSR Scientific Association of Phthisiologists.

In conclusion, it should be noted that the conference program was put together somewhat chaotically. The discussed questions did not reflect unified scientific direction. Information on therapy and detection of diseases was presented together with clinic and diagnostics reports. Questions on the organization of phthisiological and pulmonological services were repeatedly interspersed with questions on prophylaxis, diagnostics and therapy. There were few discussions

because the conference program was so filled with reports. The conference showed that further strengthening of phthisiological and pulmonological services is taking place in the republic.

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CSO: 1840/1044

UDC 617.7-073-092:535.4

HOLOGRAPHIC INTERFEROMETRY OF EYE ANTERIOR CHAMBER

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian, Vol 116, No 1, Oct 84, pp 157-160

[Article by V. S. Kontridze, D. N. Antelava, A. M. Labartkava, V. N. Togonidze and Sh. D. Kakichashvili, Institute of Cybernetics of the Georgian SSR Academy of Sciences and the Tbilisi Institute for the Advanced Training of Physicians of the Georgian SSR Ministry of Health]

[Text] The methods of holographing live objects have been described in a number of papers [1-4].

The potentialities of applying the holographic method to medicine are discussed in article [5]. At the present time, the most effective methods are a posteriori documentation of three-dimensional images, including rotary-scanning recording systems [6] for the internal cavities of the body, as well as holographic interferometry [7] for the functioning of different organs.

The feasibility of obtaining a holographic interferogram of the anterior chamber in the human eye has been demonstrated in this study. Two holograms, corresponding to two time states of the eye, are recorded on one photoplate during filming. Both pictures are formed simultaneously and interfere during the reconstruction process. The phase shift between these images, caused by the specific functioning of the recorded object, leads to the appearance of interference bands on the reconstructed image. The localization and shape of the formed bands enable us to evaluate the changes that have taken place during the studied interval of time.

The basic problem in obtaining an interferogram of the eye anterior chamber consists of selecting and realizing the time interval between the two successive exposures. Too short an interval may make it difficult to find the changes that have taken place, and too long an interval may lead to such intense changes and shifts of the eyeball that the interferometric picture may prove to be insolubly fine. All cases point to the fact that a short-term radiating laser should be used as the radiation source. We used a ruby laser ($\lambda=6943 \text{ \AA}$) for holographic filming. In the interresonator

space of the laser, a passive cell is found that contains an alcoholic solution of cryptocyanine to modulate the quality of the resonator, as well as an iris diaphragm that allows adjusting the laser to conditions of maximum spatial coherence. With the selection of cell dye concentration and pump energy, the laser was able to generate two pulses that were approximately equal with a controlled, within small limits, interval of time between them (50-200 msec).

The holographic interferograms were recorded in the counterbeams by a holographic reflector method of Yu. N. Denisyuk [8]. The hologram irradiation energy, which was in the immediate proximity of the object, did not exceed $0.95-1.5 \times 10^{-3}$ joules, cm^2 . A similar dose, directed in the form of a highly divergent beam, proved to be significantly lower than the permissible irradiation doses for the eye [9]. LOI-2 photoplates, which were treated in a triethanolamine solution (5 g per 1 liter of water) for five minutes at 20° , washed and dried, were used for recording.

Following exposure, the photoplates were developed in a GP-2 developer, fixed, washed in running water, and dried with hygroscopic paper.

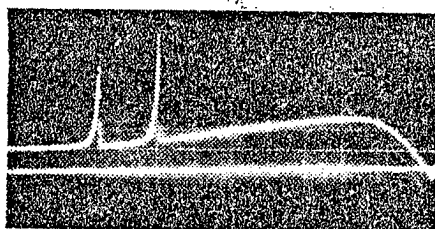


Photo 1. Oscillogram of two successively generated pulses.

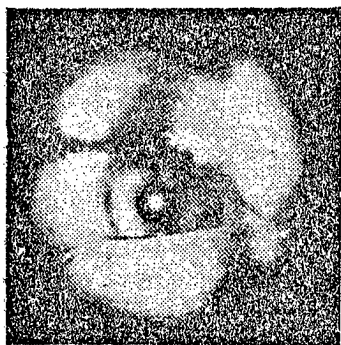


Photo 2. Photographic image of the eye, reconstructed from a single exposure hologram.

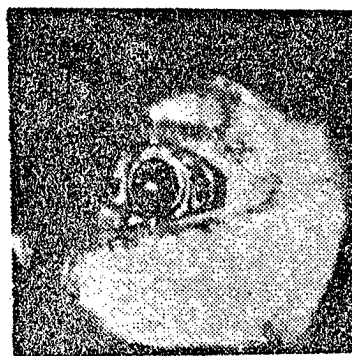


Photo 3. Photographic image of the eye, reconstructed from a double exposure hologram-interferogram.

Photo 1 shows an oscillogram of two successively generated pulses, obtained in the process of holographic recording. The time between the pulses was 150 mcsec.

Photo 2 shows a photographic image of the eye, reconstructed from a single exposure hologram. Photo 3 shows a photographic image, reconstructed from a double exposure hologram-interferogram of the same object. The interference bands, superimposed on the iris of the eye, are clearly traced in the third photograph. The bands are caused by the total effect of the artificially induced contraction of the eye diaphragm, and the change this induces in the refractive index of the aqueous humor of the eye anterior chamber that is related to its ejection forward. An interferogram recording from the side, using a contact headpiece [nasadka], is suggested in the future for a separate, differentiated investigation of these effects.

In all probability, the processing and deciphering of similar images will enable us to obtain information on the hydrodynamics of the aqueous humor in the eye anterior chamber, and this is of significant interest in the diagnostics of eye disease problems, specifically various glaucomas.

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No copyright available

12525

CSO: 1840/1771

BRIEF

NEW HIGH-TECHNOLOGY MEDICAL CENTER--Zaporozhye is the site of creation of one of the largest radiological diagnostic centers in the Ukraine. Great practical aid in outfitting it with the latest technology was rendered by the Zaporozhstal' Plant, coal-tar chemical enterprises, and other industrial enterprises and organizations of the city. Along with medical workers, qualified physicists, mathematicians, programmers, and electronics specialists are working in the center. Medical programs developed for the computer make it possible to obtain extensive information on the condition of every organ, system, or part of the body. Using gamma-cameras it is also possible to see on a color screen a display of the size and shape of the object being examined, the centers of the disease, and pathological changes. The technology helps shorten the time of the examination and make a precise diagnosis. The new center is receiving its first visitors.

[By. I. Veretel'nik, Zaporozhye] [Text] [Moscow MEDITSINSKAYA GAZETA in Russian 11 Jan 85 p 3] 12255

ADVANCES IN LASER SURGERY, WOUND AND BURN THERAPY

Moscow MEDITSINSKAYA GAZETA in Russian 29 Mar 85 p 3

[Article by, Skobelkin, O., Professor, head of the All-Union Center for the Employment of Lasers in Surgery, USSR State Prize laureate, meritorious scientist of the USSR]

[Abstract] The author comments on uses of new types of lasers which have been developed for surgical and therapeutic purposes, particularly carbon-dioxide lasers and lasers based on aluminoyttrium garnet with neodymium (YAG:Nd lasers).

The author reports that carbon dioxide lasers with a coagulating effect are now being used in operations on organs with abundant blood vessels. These lasers and accompanying sets of suturing and other instruments which have been developed for such operations are protected by certificates of invention in the USSR, and have been patented in other countries. Preparations are being made to put them into series production. Carbon dioxide lasers with a bactericidal effect are being used to treat trophic ulcers, sterilize open wounds, and perform necrectomies and other skin operations. In the tight suturing of purulent wounds, for example, the use of such lasers permits healing by first intention in 95 to 97 percent of cases, and shortens treatment time by 33 percent, according to the author. Similar results have been achieved in the treatment of deep burns with carbon dioxide lasers.

The author relates that YAG:Nd lasers, argon and copper-vapor lasers- and lasers of other types are being used to stop gastroduodenal hemorrhages and to treat certain types of tumors. In such cases, the laser light is conveyed to the point of the disorder by means of an optical fiber in an endoscope. Carbon dioxide and pulsed erbium lasers have been used experimentally for revascularization operations in cases of ischemic heart disease. Neurosurgeons reportedly have developed laser methods for operations on the brain and spinal cord.

A number of tasks for the further advancement of laser medicine are mentioned in conclusion. The author points out that progress depends not only on advances in electronics and fiber optics but also on further improvement of the specialist training system, coordination of scientific research, and publicizing of lasers' capabilities.

FTD/SNAP
CSO: 1840/1831

7 June 1985

UDC 616.89-008.441.13-036.12-06:616.43/.45-008.6

HORMONAL IMBALANCE IN CHRONIC ALCOHOLISM

Moscow ZHURNAL NEYROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA
in Russian Vol 84, No 11, Nov 84 (manuscript received 10 Apr '84)
pp 1712-1714

KOLUPAYEV, G. P. and YAKOVLEV, V. A., Main Military Clinical Hospital
imeni Academician N. N. Burdenko, Moscow

[Abstract] Serum levels of various hormones were determined by radio-immunoassay in 54 males (mean age 39 years) with chronic alcoholism and 30 control males (mean age 36 years), to assess the status of the endocrine system in such patients and uncover possible diagnostic and monitoring significance of such determinations. The most consistent features in the alcoholics were elevation of prolactin (485 μ U/ml, vs. 170.5 μ U/ml control value), and depression of testosterone levels (265.96 ng/100 ml, vs. 597.3 ng/100 ml). It appears that determination of the prolactin:testosterone ratio may have diagnostic significance in alcoholism, and can also be used as an indirect reflection of biogenic amine function in the brain.

References 12: 5 Russian, 7 Western.

[1775-12172]

UDC 616-001.36-092.9:615.355

IONOL TREATMENT OF TRAUMATIC SHOCK-INDUCED PERTURBATIONS IN LIPID PEROXIDATION

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 57, No 1,
Jan-Feb 85 (manuscript received 10 Apr 84) pp 79-82

YAKUBENKO, Ye. D., MAREYEVA, T. Ye. and MANANKOV, A. K., Donetsk
Medical Institute imeni M. Gor'kiy

[Abstract] A crushing (4 kg/cm² for 4 h) soft tissue injury was applied to posterior extremities of rats to assess its effects on lipid peroxidation and the efficiency of ionol in reversing the changes. The traumatic shock led to

an increase in renal, hepatic and blood levels of peroxidation products (malonic dialdehyde, diene conjugates), enhanced peroxide erythrocyte hemolysis, and depressed renal and hepatic levels of lipids and triglycerides, while increasing blood lipid and triglyceride concentrations. Administration of ionol (60 mg/kg) to the rats 30-40 min before the injury attenuated the effects of the injury. Similar effects were seen with the effects of ionol on the renal, hepatic and blood activities of cathepsin D, acid phosphatase, RNase and DNase which were altered by the crush injury. Ionol was thus seen to be effective in inhibiting trauma-induced activation of lipid peroxidation by free radicals, and to diminish membrane damage. References 12:

10 Russian, 2 Western.

[1813-12172]

FITTING CANDIDATE FOR KIRGHIZ SUPREME SOVIET

Frunze SOVETSKAYA KIRGIZIYA in Russian 23 Feb 85 p 2

MIKHAYLOV, L. and DOTSENKO, V., photographer

[Abstract] Professor Arstanbek Murzaliyevich Murzaliyev, doctor of medical sciences, and head of the Chair of Neural Diseases of Kirghiz Medical Institute has been nominated as a candidate for the Kirghiz SSR Supreme Soviet. All who know Murzaliyev, either personally as colleagues or as patients, or by his scientific reputation, hold him in the highest regard. Trained in Moscow by the leading Russian scientists, he has set the pace for the prevention and treatment of cerebrovascular disease in Frunze, and has served as an example for the rest of the USSR in the services he organized. As a result of the emergency service he established and the preventive measures invoked, time lost from work has decreased 1.5-fold because of cerebrovascular diseases. There is no question in anyone's mind that he will make an excellent deputy of the Kirghiz Supreme Soviet. Photographs 1 (of Murzaliyev).

[1789-12172]

MICROSURGERY NOW AND IN FUTURE

Moscow IZVESTIYA in Russian 7 Mar 85 p 3

NEKHAYEV, V.

[Abstract] Some of the therapeutic wonders achieved by the development of the specialty of microsurgery were reviewed in a discussion with Academician B. Petrovskiy, director of the All-Union Scientific Surgical Center of the USSR Academy of Medical Sciences. With the advent of microsurgical techniques, in which the operation is carried out under a microscope, delicate procedures can be performed which make possible retransplantation of

severed limbs, grafting of skin from one part of the body to another, reconnection of nerves, and repair of blood and lymphatic vessels, to name just a few applications. Today, microsurgery has found application in the treatment of infertility and in many other conditions that were untreatable just a few years ago. It is to be regretted that the Soviet medical instrumentation industry has yet to provide the tools for such surgery to be carried out, and that reliance has to be placed on foreign manufacturers.
[1772-12172]

MICROBIOLOGY

BRIEF

MICROORGANISMS TEST SOIL TOXINS--The microscope is the only way to see the "material" which is now being used in their research by associates of the All-Union Scientific-Research Institute of Agricultural Microbiology's laboratory of pesticide transformation by soil microorganisms. This material is microorganisms and microscopic algae separated from the soil which manifest high sensitivity to various toxic chemicals. "It is well known that in order to defend agricultural crops from pests, diseases, and weeds, all possible chemical means are used," says Candidate of Biological Sciences Yu. V. Kruglov, head of the laboratory. "They are fairly effective, but they also have their 'shady' aspects. Chemicals build up in the soil and become deposited in plants, lowering their potential. In addition, unwarranted increase of their use leads to damaging the environment, and even presents danger for people." Scientists have discovered bacteria which serve as unique indicators showing the nature and level of contamination of the soil, seeds, and plants by chemicals. The "reports" of the minute objects serve as the basis for finding antidotes to decrease the negative effect of the chemical substances, and also for developing methods of using them rationally. The Leningrad microbiologists have also isolated microorganisms which can decompose the pesticides put into the soil. By accelerating the process of this "degradation" of toxic chemicals, the bacteria are able to preserve the "health" of the soil and obtain stable harvests. [By S. Lypko] [Text] [Leningrad VECHERNIY LENINGRAD in Russian 11 Jan 85 p 2] 12255

CSO: 1840/1768

UDC 616.98:579.842.14]-078.73

MAPPING OF GENETIC DETERMINANT CONTROLLING SYNTHESIS OF SALMONELLA K ANTIGEN. PART 2. NONMOTILE MUTANTS OF SALMONELLA TYPHIMURIUM

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 85 (manuscript received 15 Feb 84) pp 34-38

ROMANOVA, Yu. M., TARUTINA, Z. Ye., STEPANOVA, L. K., BELAYA, Yu. A.,
and PETROVSKAYA, V. G., Institute of Epidemiology and Microbiology
imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] The nitrosoguanidine technique was used to obtain nonmotile *Salmonella typhimurium* mutants for transduction mapping of the genetic determinant responsible for controlling the synthesis of the K antigen. The nonmotile mutants fell into two groups, those nonagglutinable by specific H and K antisera, and those that can be agglutinated (i.e., Mot⁻H⁻K⁻ (motA or motB mutants), and Mot⁻H⁺K⁺ (H1 or fla⁻ mutants)). Phage P22HT-mediated transduction of the motility factor to the H⁻K⁻ mutants and the H1⁻ and flaE⁻ mutants led to recovery of agglutinability by both the H and K antisera in all Mot⁺ recipients. In addition, spontaneous reversion to the H⁺K⁺ phenotype was also observed in the case of the H⁻K⁻ mutants. These observations indicate that the genetic determinant responsible for K antigen synthesis is cotransduced with the genes of the Fla operon, particularly the H1 and the flaE genes and that, therefore, its expression is under Fla operon control. Figures 2; references 10: 5 Russian, 5 Western.
[1798-12172]

7 June 1985

UDC 579.843.1:579.253

INDUCTION OF VIBRIO CHOLERAЕ MUTANTS WITH ALTERED TOXIN PRODUCTION

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 85 (manuscript received 5 Dec 83) pp 38-40

LIVANOVA, L. F., YEROSHENKO, G. A. and SMIRNOVA, N. I., All-Union Scientific Research Antiplague Institute "Mikrob", Saratov

[Abstract] *Vibrio cholerae* mutants showing altered toxin production were induced by treatment of highly toxigenic strains (*V. cholerae* 569B) with N-methyl-N'-nitro-N-nitrosoguanidine. Toxigenic mutants were selected on the basis of passive immune hemolysis in Petri dishes, with subsequent analysis of the biological activity of the toxin by the Craig method [Nature, 207:614-616, 1965]. Virulence was determined by the isolated rabbit intestinal loop technique. The resultant mutants carried multiple markers and basically consisted of two classes: one group failed to produce detectable toxin, while the other showed toxin hyperproduction. Figures 1; references 14: 2 Russian, 12 Western.
[1798-12172]

UDC 579.88;579.253.04;615.332

ANTIBIOTIC SENSITIVITY OF ERYTHROMYCIN-RESISTANT RICKETTSIA PROWAZEKII E DURING CULTIVATION IN LICE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 2, Feb 85 (manuscript received 7 Jul 83) pp 41-45

KLIMCHUK, N. D., KATSARA, M. S., FROLOVA, O. M. and BALAYEVA, N. M., Lvov Scientific Research Institute of Epidemiology and Microbiology, Ukrainian SSR Ministry of Health; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Stability of erythromycin resistance of *Rickettsia prowazekii* EErCW and its concomitant susceptibility to tetracycline and levomycetin was tested in the course of long-term maintenance (50 passages) in lice. The rickettsiae retained erythromycin-resistance in the absence of the antibiotic, while remaining sensitive to tetracycline and levomycetin. The degree of sensitivity to the latter antibiotics was on par with that exhibited by *R. prowazekii* E, the parental strain from which EErCW rose by a spontaneous mutation. These observations point to the stability of the erythromycin mutation. In addition, on adaptation to the host organism, EErCW showed a further diminution in toxicity for white mice. However, its hemolytic activity continued to rival that of the virulent parental strain. References 10: 4 Russian, 6 Western.
[1798-12172]

UDC 577.152.1

MECHANISM OF CYSTEINE OXIDATION IN CYANOBACTERIA MEMBRANES

Moscow BIOKHIMIYA in Russian Vol 49, No 12, Dec 84
(manuscript received 8 May 84) pp 2026-2028

BARSKIY, Ye. L., KAMILOVA, F. D. and SAMUILOV, V. D., Biology Faculty,
Moscow State University imeni M. V. Lomonosov

[Abstract] Data concerning oxidation of cysteine, which stimulates Fe^{3+} and effectively suppresses cyanide, benzhydroxamate and NH_2OH , indicated that the possibility of enzymic oxidation of cysteine in the respiratory chain of cyanobacteria is doubtful. Cells of cyanobacteria *Anacytis nidulans* and *Anabaena variabilis* were studied. Oxidation of cysteine by O_2 was intensified in the presence of isolated *Anabaena variabilis* and *Anacystis nidulans* cyanobacteria; it was stimulated by Fe^{3+} ; it increased with an increase of pH and, regardless of the presence of membranes, was suppressed by cyanide, benzhydroxamate and hydroxylamine but was not suppressed by azide. These compounds inhibited membrane respiration when ascorbate and N',N',N,N-tetramethyl-p-penylenediamine (TMPD) were present but did not affect their non-enzymic oxidation. Ascorbate in combination with TMPD is oxidized in the respiratory chain of cyanobacteria while cysteine is not a substrate of oxidation for cytochromoxidase. The increase of rate of oxidation of cysteine in the presence of isolated membranes of cyanobacteria was tentatively assumed to be due to the presence of admixtures of cations of transition metals. Figures 2; references 9; 1 Russian, 8 Western. [1793-2791]

UDC 615.373.3.015.46.076.9

DIFFERENTIAL AFFINITY OF LECTINS FOR PATHOGENIC MICROORGANISMS DETERMINED BY SANDWICH IMMUNOFLUORESCENCE USING FLUORESCHEIN ISOTHIOCYANATE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1,
Jan 85 (manuscript received 17 May 84) pp 30-33

LAKHTIN, V. M., GUSEVA, N. I., FEDURKINA, N. V., CHIBISOVA, V. A. and
SHAKHANINA, K. L., Institute of Biochemistry imeni A. N. Bakh, USSR Academy
of Sciences; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya,
USSR Academy of Medical Sciences, Moscow

[Abstract] The affinity of a variety of lectins for certain pathogenic microorganisms was studied by the sandwich immunofluorescence technique, using fluorescein isothiocyanate-labeled donkey IgG against rabbit IgG. Examination of the fluorescence data demonstrated that the lectins in question bound preferentially to some pathogenic agents, and on that basis the latter could be differentiated. Concanavalin A, wheat germ agglutinin, and phytohemagglutinin showed preferential binding to *Coxiella burnetii*,

Salmonella typhi, *S. paratyphi*, *Shigella sonnei*, and *Bacillus anthracis*. However, the binding of phytohemagglutinin to *B. anthracis* and the enteric pathogens was very weak by comparison with the other two lectins. *Rickettsia prowazekii* and *Francisella tularensis* failed to bind any of the lectins, while *Brucella abortus* and *Treponema pallidum* showed moderate to weak fluorescence with all three lectins. These observations indicate that the use of lectins for the differentiation of certain pathogenic microorganism may be a promising diagnostic tool. Figures 4; references 17: 3 Russian, 14 Western.
[1797-12172]

MILITARY MEDICINE

ADVANCED EQUIPMENT AT MILITARY MEDICAL ACADEMY

Moscow KRASNAYA ZVEZDA in Russian 4 Dec 84 p 4

[Text] These photos were taken in Leningrad, at the Military Medical Academy imeni Kirov, which is one of the oldest educational institutions of the USSR Armed Forces. The chair of ophthalmology has a large arsenal of equipment for the fight against diseases of the organs of vision. The photo on the right shows the laser laboratory. Captain of the Medical Service A. Gatsu, a candidate of medical sciences, is using a laser beam in the treatment of former artilleryman G. Tkachenko, who was a participant in the Great Patriotic War.

The photo on the left shows the outpatient and surgery room of a submarine, which is one of the training facilities for students of the academy. Lessons are being given by Colonel of the Medical Service S. Smirnov, a candidate of medical sciences who has served as a physician on one of the submarines of the Northern Fleet.

The chair of naval and hospital surgery is doing extensive work on the introduction of modern methods of diagnostics into military medical practice. The photograph below shows Colonel of the Medical Service V. Ozerov, senior instructor of this chair and a candidate of medical sciences, acquainting students with a system for automated diagnosis which uses microprocessors, a video terminal and a printer.

FTD/SNAP

CSO: 1840/185

PHARMACOLOGY AND TOXICOLOGY

UDC 615.22:547.869.2].099

MORICIZINE (ETMOZIN) TOXICITY IN PHYSIOLOGICAL STRESS CONDITIONS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 48, No 1,
Jan-Feb 85 (manuscript received 1 Jun 84) pp 60-62

NANAYEVA, M. T. and IVANOVA, A. V., Chair of Pharmacology, Kirghiz Medical
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[Abstract] Outbred male and female rats were tested for the effects of hyperthermia, adaptation to hypoxia, or a combination of the two factors on the toxicity of moricizine (etmozin), since physiological status is recognized to affect the clinical efficacy and toxicity of drugs. Hyperthermia was induced by exposure of the animals to an ambient temperature of 45°C until the rectal temperature rose by 1°C, while adaptation to hypoxia consisted of 40 daily exposures to an altitude of 600 m in a pressure chamber for 6 h/day. In control rats the LD₅₀ on intraperitoneal administration was calculated at 105.3 mg/kg, in hyperthermic rats at 143 mg/kg, in rats adapted to hypoxia the LD₅₀ was 71 mg/kg, and in rats subjected to a combination of hyperthermia and adaptation to hypoxia this parameter stood at 73 mg/kg. The metabolic changes resulting from hyperthermia, including elevated glucocorticoid levels and enhanced energy metabolism, evidently predispose to greater tolerance of moricizine. The greater toxicity of moricizine in the hypoxia-adapted rats was apparently due to its known effects as an uncoupling agent of oxidative phosphorylation, since in such animals the degree of coupling is particularly high. Figures 1; references 18: 16 Russian, 2 Western.
[1802-12172]

UDC 615.214.074:543.544

GAS CHROMATOGRAPHIC ANALYSIS OF VARIOUS CLASSES OF PSYCHOTROPIC AGENTS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 48, No 1, Jan-Feb 85
(manuscript received 8 Jun 84) pp 35-39

ZURABASHVILI, Z. A., MIZRAKHI, L. M. and TSINTSADZE, M. S.,
Chromatography Center of the Georgian SSR; Clinical Biophysics and
Biochemistry Laboratory, Scientific Research Institute of Psychiatry
imeni M. A. Asatiani, Georgian SSR Ministry of Health, Tbilisi

[Abstract] Procedures have been devised for the analysis of the five classes of psychotropic agents (neuroleptics, anxiolytics, antidepressants, stimulants, psychodysleptics) in body fluids, consisting of a series of extraction steps and subsequent gas-liquid chromatography. The basic approach consists of the parallel isolation of a number of agents by successive extraction from an aqueous solution by ether and chloroform at different pH values, which results in their separation into acid, basic, neutral, and amphoteric substances. The techniques developed at the Chromatography Center rely on equipment and supplies manufactured in the USSR or the socialist countries, and have shown that virtually all psychotropic agents can be successfully analyzed by the Soviet Tsvet-100 gas chromatograph. Figures 3; references 4; 3 Russian, 1 Western.
[1802-12172]

UDC 615.212.7:[547.94:582.635.38].015.4:612.822.3

NEUROMEDIATOR EFFECTS OF Δ -9-TETRAHYDROCANNABINOL ON EVOKED POTENTIALS IN CEREBRAL CORTEX

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 48, No 1, Jan-Feb 85
(manuscript received 6 Jan 84) pp 20-23

BARKOV, N. K. and MACHULA, A. I., All-Union Scientific Research Institute
of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow

[Abstract] Studies were conducted on the EEG correlates of Δ -9-tetrahydrocannabinol (THC) effects against a background of altered neurotransmitter function in cats with developed avoidance reflexes. Administration of THC (3.5 mg/kg, i.p.) resulted in depression of the P₁, N₁, P₂ and N₃ waves of the evoked potential (EP) in the visual and associative cortex. The primary response waves remained most distinct. In somatosensory zone II the amplitudes of the primary response waves were markedly diminished, especially of the positive phase, while the P₁, N₁ and P₂ waves of the EP disappeared completely. Administration of serotonin antagonists and dopamine agonists led to recovery of normal EEG patterns in the visual, somatosensory and associative areas of the neocortex. In addition, the serotonin antagonists, in conjunction with THC, were found to affect both the input of visual

information and its interpretation, while the dopamine antagonists (in conjunction with THC) affected only the interpretation. Figures 1; references 15: 7 Russian, 8 Western.
[1802-12172]

UDC 615.217.34.015.4.076.9

TROPARYL PHARMACOLOGY

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 48, No 1, Jan-Feb 85
(manuscript received 6 Jun 84) pp 15-19

ZAKUSOV, V. V. and NAUMOVA, B. I., Laboratory of Pharmacology of Nervous System, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow

[Abstract] A novel CNS stimulant was synthesized by the addition of an aryl radical to C₃ of tropane, resulting in troparyl (2-betamethoxycarbonyl-3-beta-phenyltropane or (2-exo-3-exo)-2-carbomethoxyaryltropane. Pharmacologic studies with intraperitoneally administered troparyl to outbred mice, cats or rabbits demonstrated that this agent exceeded amphetamine as CNS stimulant, but was far less toxic to mice. The respective LD₅₀ values on intraperitoneal and intravenous administration to mice were 185 and 50 mg/kg, versus 13 mg/kg for amphetamine on intraperitoneal injection. In the mice study, troparyl facilitated summation of impulses in the CNS over a wide dose range (0.01-1 mg/kg), but lacked any analgesic effects. Figures 2; references 3: 2 Russian, 1 Western.
[1802-12172]

RESOLUTIONS OF PLENUM OF ALL-UNION SCIENTIFIC SOCIETY OF PHARMACOLOGISTS, SEPTEMBER 17-20, 1984, IN IRKUTSK

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 48, No 1, Jan-Feb 85
(manuscript received) pp 124-125

[Abstract] The September 17-20, 1984 Plenum of the Society demonstrated that current scientific research is directed at solving important pharmacological and public health problems. Fundamental advances have been made in neuro-psychopharmacology, particularly in studies on the molecular and neuro-chemical mechanisms of action of tranquilizers, antidepressants, and neuroleptics, including their interactions with receptors, membranes, and model systems. Considerable progress is being made in studies on GABA-ergic and nootropic agents, complemented by novel approaches in their preventive and therapeutic use. Extensive studies are being conducted on drug prevention and early treatment of vital-function disturbances in various emergency situations (shock, intoxication, hyperthermia, hypothermia, hypoxia, stress, etc.). Certain derivatives of pyrimidine, thiobarbiturate, anthraquinone, imidazole, pyridone, etc., have been established to be particularly promising

in this respect. In immunopharmacology new immunostimulants and modulators have opened new vistas in the prevention and treatment of infections, autoimmune diseases, neoplasms, and immunodeficiency states. In addition, highly effective preparations have been derived for protection against chemical pollutants and other toxic agents. Recent information on the neurochemical and biochemical mechanisms that underlie predisposition to drug addiction and alcoholism has provided the impetus for the search for pharmacologic agents that can be used in the prevention and treatment of such problems. Among the resolutions of the Plenum was a call for the creation of a Siberian Pharmacological Society, and to hold the next Plenum in 1986.

[1802-12172]

UDC 615.9.076.9.015.4:616.155.3-008.931-074

INFORMATIONAL VALUE OF ENZYME CYTOCHEMISTRY OF PERIPHERAL LEUKOCYTES IN TOXICOLOGIC EXPERIMENTS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 48, No 1, Jan-Feb 85
(manuscript received 11 Apr 84) pp 83-86

BEREZOVSKAYA, I. V. and VLASOVA, M. Ye., Laboratory of Toxicology of Drugs and Biologically-Active Compounds, Scientific Research Institute for the Biological Testing of Chemicals, Kupavna, Moscow Oblast

[Abstract] The information content of leukocyte enzyme cytochemistry in toxicologic studies was investigated in the case of outbred rats, with CCl_4 -induced liver damage, HgCl_2 -induced renal pathology, or NaNO_2 -induced hypoxemia. Analysis of the activities of enzymes involved in redox reactions (depressed activities) and hydrolytic reactions (elevated activities) demonstrated that the changes were dose-related, while their general similarities indicated nonspecificity. A sensitive indication of the degree of toxicity can be obtained by means of linear discriminant analysis of the 5 enzymes investigated in this study (succinate dehydrogenase, mitochondrial alpha-glycerophosphate dehydrogenase, myeloperoxidase, and acid and alkaline phosphatases). Figures 1; references 9: 4 Russian, 5 Western.

[1802-12172]

7 June 1985

PHYSIOLOGY

PRESSURE CHAMBER SIMULATION OF 450-METER DIVE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Mar 85 p 4

LAGOVSKIY, V.

[Abstract] The lengthy article gives an account of a recent experiment to study the physical limits of divers at the Southern Branch of the USSR Academy of Sciences' Institute of Oceanology. Pressures at deep levels of the ocean were simulated with a pressure-chamber complex at the institute. The complex is equipped with systems for life support and medical monitoring. The subjects of the experiment were two oceanologists and two physicians, who spent almost a month inside the chambers. This 'crew' consisted of Rodion Unku, the leader, Vladimir Tutubalin, Aleksandr Suvorov and Vladimir Podymov.

Doctor of Technical Sciences V. Yastrebov, deputy director of the oceanology institute and director of the experiment, and Professor A. Genin, scientific director of the medical-biological portion of the experiment, commented on its objectives and methods. Whereas Soviet divers have worked at a depth of 240 meters underwater, operations which are beyond the capabilities of robots and submersible craft sometimes must be performed at still greater depths, where the pressure is as great as 450 tons per square meter of surface, Yastrebov explained. The pressure-chamber experiments were begun for the purpose of testing methods which would enable divers wearing no pressure suits to work under such conditions.

It is reported that medical personnel developed a descent-and-ascent schedule which would be safe for humans, as well as a mixture called 'trimix' which the subjects breathed at simulated depths of more than 150 meters. Less than 1 percent of this mixture by volume is oxygen. The rest consists of helium and nitrogen in proportions selected so as to forestall physical symptoms resulting from pressures at certain depths. In the course of the experiment, studies were made of the types of work divers can handle in such conditions. They determined optimal routines for their work, leisure time and sleep; effects of high pressure on the human psyche, the functioning of the brain, and human capabilities for analyzing situations and making decisions; and many other questions. Pressures at depths as great as 350 meters were simulated for all four of the subjects. Only Unku and Tutubalin took part in the final

stage of the experiment, in which they spent almost four days in a compartment separated from the rest of the complex. A depth of 450 meters was simulated inside this compartment.

No impairments of the subjects' health reportedly were observed as a result of the experiment. Yastrebov foresaw the use of shipboard chambers similar to the institute's chambers for the compression and decompression of divers before and after deep dives.

Two photographs are given showing Unku, Tutubalin, Suvorov and Podymov; and a portion of the pressure-chamber complex.

FTD/SNAP

CSO: 1840/303

UDC 612.017.1-08

PHENOMENON OF UNIVERSAL ROSETTE-FORMING CELL STIMULATION BY EXTREME STRESS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 85 (manuscript received 13 Jun 84) pp 72-76

PETROVA, I. V., KUZ'MIN, S. N., KURSHAKOVA, T. S., SUZDAL'NITSKIY, R. S., LEVANDO, V. A. and PERSHIN, B. B., Central Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov; All-Union Scientific Research Institute of Physical Culture; Central Skin and Venereological Institute, Moscow

[Abstract] Immunity factors were analyzed in highly trained 18-21 year old athletes subjected to extreme physical and emotional stress. Extreme stress situations were found to be without effect on the levels of immunocompetent cells and cells responsible for nonspecific immunity. However, the stressful states depressed the percentage of phagocytically active neutrophils, salivary lysozyme activity (without affecting blood lysozyme activity), and depressed immunoglobulin concentrations. The singularly most impressive effects of extreme stress consisted of pronounced ($p < 0.0001$) elevations of universal rosette-forming lymphocytes and neutrophils vis-a-vis unstressed control subjects. The phenomenon of the universal rosette-forming cells may account for the depletion of immunoglobulins, by assuming that a portion of the circulating immunoglobulins were bound to the surface of these cells due to hormonal and other factors. References 9: 8 Russian, 1 Western.
[1798-12172]

UDC 612.014.43:577.121.5

CHANGES IN PENTOSE AND GLUCURONATE PATHWAY DEHYDROGENASES IN RAT BRAINS FOLLOWING SINGLE OR MULTIPLE HYPOTHERMIC EPISODES

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 1, Jan-Feb 85 (manuscript received 24 Dec 83) pp 67-70

VOLZHINA, N. G., Daghestan Medical Institute, Makhachkala

[Abstract] Studies were conducted on the changes in the dehydrogenase activities of the pentose and glucuronate pathways of the brain of rats

subjected to hypothermic episodes lowering their rectal temperature to 19-20°C. A single reduction of body temperature to 20°C resulted in marked decrease in glucose-6-phosphate (I) and 6-phosphogluconate (II) dehydrogenases (pentose pathways), as well as in an increase in the activity of UDP-glucose dehydrogenase (III; glucuronate pathway). After 5-7 hypothermic episodes I and II showed a 15-25% decrease in activity, while III showed a 54% increase. After 15-17 hypothermic episodes I and II decreased 50-53% in activity, while the activity of III decreased 85%. These cold-induced changes in the enzymes of the pentose and glucuronate pathways, which share the same basic substrate, places them in competition with the Embden-Meyerhof pathways for glucose-6-phosphate. References 17: 1 Ukrainian, 12 Russian, 4 Western. [1813-12172]

ANATOMY OF STRESS

Moscow ZNANIYE-SILA in Russian No 2, Feb 85 pp 17-19

RYLOV, A., candidate of medical sciences

[Abstract] The 36th Annual Conference of the Pavlovian Society, founded by the American scientist H. Gent [sic], was held in Moscow and was entitled "Emotions and Behavior: A Systemic Approach". This conference was dedicated to the memory of Academician P. K. Anokhin and his theory of functional systems. In summary, the now widely accepted theory holds that human and animal behavior is directed at securing some useful adaptational goals, and that to attain such a positive result temporary functional associations are formed between certain brain structures and various organs, referred to as functional systems. Imbalance in such systems or failure to achieve an efficient functional system is the cause of stress. Much data was presented at the conference in support of this theory and its further development. Of particular interest were data on the fact that most damage is sustained by those organs that received the greatest functional challenge. For example, monkeys terrified while eating developed gastric ulcers, while others developed hypertension under the influence of a similar stimulus presented during a non-eating period. The conference was also affected by the malicious "international" stress generated by the present American administration, which attempts to diminish scientific contacts between the USSR and the USA. Despite this, however, Russian, American, English, French, Bulgarian, German and Japanese scientists did have an opportunity to get together for worthwhile discussions. Figures 1. [1760-12172]

7 June 1985

ACCLIMATIZATION TO FAR NORTH

Moscow TRUD in Russian 19 Mar 85 p 3

ASAKOVA, Ye., Noril'sk, Krasnoyarsk Kray, interviewer

[Abstract] This article entitled "If You Like The North" describes an interview of V. Khasmulin, candidate of medical sciences, director of the Scientific Research Laboratory of Polar Medicine, Siberian Department, USSR Academy of Medical Sciences by Isakova a Trud correspondent. Kasmulin advises that persons over 35 years of age and those with chronic diseases should not relocate to the far north. He says that persons from the Caucasus, Central Asia, the Ukraine and Baltic region adapt best to conditions of the far north. He discusses the health and physical and psychological hazards of the magnetic storms, long polar nights, arid air and abrupt pressure drops encountered in the far north and describes aggravation of some physical and pathological conditions which might be expected because of these natural phenomena. He describes the use of long-range predictions of magnetic storms for medical purposes. He evaluates the work and results of the "Five-Years of Health" program, the 2d five-year period of which is now in its final stages.

[284-2791]

7 June 1985

PUBLIC HEALTH

INSTALLING MODEL AUTOMATED SYSTEMS FOR MASS HEALTH CHECKUPS

Moscow IZVESTIYA in Russian 20 Feb 85 p 3

[Article by S. Krayukhin in the column "From Competent Sources": "The Engineer in the Polyclinic"]

[Text] With a view to providing universal annual preventive health care for the inhabitants of our country the Automated System of Preventive Examinations of the Population -- ASPON -- is being set up. The Design Bureau of Biological and Medical Cybernetics of the Leningrad Electrical Engineering Institute imeni V. I. Ul'yanov [Lenin] has undertaken to set up model ASPON projects. Director of the Scientific Center of Biological and Medical Cybernetics, Doctor of Engineering Sciences, Professor and Lenin Prize winner V. M. AKHUTIN comments on the decision.

Leningrad--Not a single country in the world has solved the problem of universal preventive health care for the population. Putting it into practice in the USSR will require enormous efforts not only from physicians but also from engineers, mathematicians and representatives of other "non-medical" professions. Physicians will be helped to "cope" with large groups of examinees by automated systems--electronic health centers equipped with microprocessors, computer technology, and also the most up-to-date mathematical methods of processing results.

In working out the structural scheme of ASPON our associates visited many cities in the country and familiarized themselves with the work of polyclinics and medical and sanitary departments in providing health care to the population. We sought to interrogate as many physicians and practical workers as possible and more fully take into account their requirements for an automated health center. These data have given us invaluable assistance in working out the medical and technical basis of the system.

Study of the needs of practical public health care showed that for delivering the most complete preventive health care it is necessary to set up four types of automated systems: for industrial enterprises, for polyclinics, ASPONs for

children and ASPONs for students. Our development engineers are being guided right now by exactly these objectives.

When automated systems have been introduced into the practice of public health care each of the visitors will spend much less time on being examined than he does today. That is convenient for us and for the patients, and advantageous to the State.

An examination in ASPON consists of passing through its subsystems sequentially: automated registry, the laboratory, consulting rooms for examination via instruments, etc.

A wide variety of the newest methods and developments that have already proved themselves are to be utilized. For example, we shall take advantage of the experience of Tbilisi physicians in automated processing of fluorographic photographs, of Kharkov researchers in the diagnostics of glaucoma, of Leningrad scientists in color testing in the presence of certain mental deviations, of Latvian scientists in utilizing microcomputers when conducting comprehensive automated medical examinations of the population, and of Moscow specialists from First Medinstitut [Medical Institute] imeni I. M. Sechenov in the automated examination of students. They are examining patients with a surgical and therapeutic profile via an application of infrared imaging. Moreover, ASPON is a self-learning system, and all new things and new methods that have earned recognition from physicians can be introduced into it.

All those who undergo preventive health care will be assigned to one of three groups: "healthy", "belonging to a risk group" and "ill". In the second group the subgroup of people with a higher risk of disease will be picked out. They will be given recommendations as to a regime of labor and rest, and dates for additional preventive health care monitoring will be set. Those holding a card stamped "ill" will receive precise instructions as to where they should direct themselves next -- to an oculist, a cardiologist, etc. Thus ASPON will contribute to the discovery of diseases at the earliest stages.

Medsanchast' [Medical and Sanitary Department] No. 7 of the Kirov Plant is becoming the base institution for our developments. Already by the end of the current year we plan to carry out mass automated checkups here via separate subsystems of ASPON. We shall deploy the system altogether completely within three years. We shall take advantage of the experience we shall gain in examining the workers of this enterprise, setting up other variants of the automated system -- in particular, a portable circulated version of ASPON for the polyclinics of our country.

ASPON-S is being developed along the lines of the well-known Student Health Program of the USSR Ministry of Health. The first subsystem is being installed at the present time in the clinic of First Leningrad Medinstitut.

In the near future we shall initiate checkups of students from two Leningrad VUZ's, recording electrocardiograms and biochemical analyses.

With the introduction of automated systems into medical practice the engineer will become the physician's most active helper. Thus the staff of an ASPON-1 system (for industrial enterprises) will comprise: one physician, one computer operator, 10 nurses and one engineer. The throughput of an automated health center is approximately 150 people a day.

12731

CSO: 1840/272

7 June 1985

BRIEF

HEALTH CARE FOR FARMERS--Riga, 14 [Mar]--A total of 166 uchastok hospitals and 44 walk-in facilities were built in this republic to render medical care to the rural population. Their employees implement constant preventive observation of the health of field and farm workers. Last year 80 to 90% of the rural population underwent dispensary enrollment. The rural uchastok hospitals and walk-in facilities are completely manned in all rayons of this republic, and emergency care brigades have been formed. [By S. Kuznetsov, correspondent of SEL'SKAYA ZHIZN'] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Mar 85 p 3] 10,657

CSO: 1840/1808

DIVING SIMULATION EXPERIMENT WITH PRESSURE CHAMBERS

Moscow MEDITSINSKAYA GAZETA in Russian 3 Apr 85 p 4

FAYBISHENKO, Yu., correspondent (Gelendzhik, Golubaya Bay)

[Abstract] The article provides information on methods and results of a recent medical experiment in which pressures at deep levels of the ocean were simulated with pressure chambers.* The experiment was conducted by scientists of institutes of the USSR Ministry of Health, the USSR Academy of Sciences' Institute of Oceanology, and the laboratory of the brain of the Bulgarian Academy of Sciences. The subjects of the experiment were four diving researchers: physicians R. D. Unku and A. V. Suvorov, and engineers V. K. Tutubalin and V. S. Podymov. They were inside a complex consisting of four pressure chambers, at the oceanology institute's Southern Branch near Gelendzhik.

Professor A. M. Genin, science consultant for the medical-biological portion of the experiment, related that it was conducted for such purposes as selecting optimal compression and decompression procedures for divers and ensuring normal working fitness at deep levels of the ocean. Studies were made of the cardiovascular systems, external respiration and central nervous systems of the subjects. A brief description is given of the four divers' daily schedule of activities inside a pressure chamber at a simulated depth of 350 meters. (It is recalled that this 'depth' was first achieved in the same laboratory during an experiment in 1981).** A pressure of 35 atmospheres was maintained in this chamber. The subjects' research activities included taking blood samples from each other. A team of researchers from the Bulgarian laboratory made electroencephalograms of the subjects by remote means.

An account is given of an experiment in which Unku and Tutubalin spent several days inside the complex's second pressure chamber, which is called "Sharik" (ball). A depth of 450 meters was simulated. Candidate of Medical Sciences I. P. Poleshchuk was the director of the medical portion of this experiment.

*See the Daily SNAP, March 29, 1985, p. 4, col. 1

**See the Daily SNAP, October 2, 1981, p. 3, col. 2

The experiments make it possible to solve problems of organizing special medical support for divers working at great depths, according to I. P. Komordin, head of an administration of the USSR Ministry of Public Health. Komordin mentioned that subsequent stages of the program call for actual dives in water.

FTD/SNAP

CSO: 1840/1831

UDC 616-084:614.2:008

PREVENTIVE MEDICINE: A CHARACTERISTIC TRAIT OF SOCIALIST HEALTH CARE

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, Jan 85 pp 3-6

[Abstract] Having reached the final year of the 11th Five Year Plan, it appears appropriate to underscore some of the achievement of Soviet medicine in that period of time. The Soviet approach to health care has always emphasized prevention, and the emphasis from 1981 to 1985 has been on improving longevity figures and the duration of working life, as well as on general health improvement. A signal factor has been the implementation of nationwide periodic health examinations [dispensarization]. The success of this plan demands not only expertise from medical personnel, but the joint effort of the entire Soviet society and the active cooperation and participation of all the government and party organizations. The major responsibility rests on the shoulders of every medical worker, who should direct and inspire the populace to comply with the requirements of this program.
[239-12172]

UDC 614.2:65.012.2]:[519.86:681.31

MATHEMATICAL MODELS AND DATA PROCESSING IN AUTOMATED ALLOCATION OF HEALTH RESOURCES

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, Jan 85
(manuscript received 18 Jun 84) pp 19-24

LOGINOV, B. R., All-Union Scientific Research Institute of Social Hygiene and Organization of Public Health imeni N. A. Semashko, Moscow

[Abstract] The complexity of modern society and of the various ramifications of public health administration require that a more quantitative approach be taken to the allocation and utilization of health resources. The success of a more scientific approach to health administration rests on the judicious use of mathematical models and the analytic capabilities of modern computer systems. Adequate planning in health administration requires the creation of an automated model technology to provide mathematical models that can be readily applied and understood by the health workers, rather than the creation

of mathematical challenges that may be esoteric but impractical. The use of such models in analyzing current problems and in long-range planning can only be realized in conjunction with appropriate data processing technology. Preliminary studies have already been completed utilizing a PRIMUS program based on PL/1 language in the USSR and Czechoslovakia. References 6 (Russian).

[239-12172]

UDC 616.12-008.331.1-057-07:313.13

HYPERTENSION IN WOMEN ENGAGED IN SHIP REPAIR WORK

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, Jan 85
(manuscript received 23 Jul 84) pp 33-35

LIBENZON, R. T., ANDRYUSHCHENKO, I. V. and KITAYSKAYA, L. S.,
Vladivostok Medical Institute

[Abstract] A health survey was conducted in Vladivostok on 2622 female workers to monitor the incidence of hypertension in that occupational group. The cohort ranged in age from 20 to 59 years, with the criterion of hypertension taken as a diastolic pressure of 95 mmHg or more. On this basis, 18.5% of the workers were identified as hypertensives, with the following age breakdown: 29-29 years--2.8%, 30-34 years--6.9%, 35-39 years--18.3%, 40-44 years--22.2%, 45-49 years--28.8%, 50-54 years--40.5%, and 55-59 years--46.0%. In addition, borderline hypertension was constituted in 11.7% of the workers. The value of such periodic examinations is self-evident in that it leads to early identification of individuals at risk and, consequently, early treatment and timely prevention. References 2 (Russian). [239-12172]

GEORGIAN SEPSIS CENTER

Tbilisi KOMUNISTI in Georgian on 13 December 1984, p 4

[Editorial Report]

[Abstract] N. Norakidze has a 900-word interview with Professor V. Bochorishvili, head of the Georgian SSR Anti-Sepsis Center that was founded in 1979, concerning the center's purpose, history, practices, and research being done there. Before the center was created, sepsis victims coming to Tbilisi for treatment were dying at a rate above 50 percent. Goal-oriented work on prompt diagnosis, the development of "immune compounds," and application of the latest medical techniques led to the creation of the center. Now the death rate is down to 15-18 percent among surgical sepsis victims and 4.3 percent in nonsurgical sepsis--figures that many specialists in the USSR doubted until they came to Tbilisi and saw for themselves. By now, some 200 specialists have taken

courses in the center, and USSR Health Minister Burenkov rated its work highly in the autumn of 1983. Increased funding for the center has fostered an improved material-technical base, and a main building now under construction is to be completed in late 1985. The proposal has been made to set up similar centers in all oblasts (also in republics that are not subdivided into oblasts). The center's research efforts have paid off: Two Georgian-made compounds, antistaphylococcic heterogeneous globulin and intravenous staphylococcic phage, have been successfully tested. A third, interferon obtained from the placenta, is undergoing tests.

[CSO: 1840/300E]

PROBLEMS WITH DRUG SUPPLIES

Moscow IZVESTIYA in Russian 4 Mar 85 p 2

[Abstract] In view of a large number of complaints about the unavailability of common drugs for treating colds and influenza during the winter season in many areas of the USSR, IZVESTIYA correspondents in many regions were asked to conduct a surveillance of the pharmacies in their localities. Basically, the reports from Krasnodar Kray, Kirghizia and Georgia indicate that the problem lies in poor administrative procedures and an inadequate distribution system. While certain drugs are readily available at central pharmacies, they may be unavailable in local pharmacies in the same city. Other drugs are available in an oversupply, because the pharmacy receives much more than it ordered and can possibly dispense within the expiration date, while in other cases a wrong dosage form may be delivered; for example, preparations intended for children rather than adults, which then have to be dispensed to adults in larger doses. The question that comes to mind is: What is the Main Pharmaceutical Administration of the USSR Ministry of Health going to do about this state of affairs?

[1773-12172]

ROLE OF ORGANIZATIONAL AND METHODOLOGICAL OFFICE OF CHILDREN'S HOSPITAL IN
IMPROVING HEALTH OF CHILDREN

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 11, Nov 84, pp 6-8

KHUSAINOVA, Sh. N., ADAMOVICH, S. L. and ZHUNUSOV, K. Kh., Kazakh
Scientific Research Institute of Pediatrics, Alma-Ata

[Abstract] Basic trends being used in leading oblast hospitals to reduce morbidity and mortality in children are described and discussed. The importance of emphasis on improvement of organizational work by organizational and procedural offices rather than on "physical" aid was pointed out. This emphasis should include organizational assistance to rural medical institution, organizational assistance to pre-school institutions and oblast health departments. Each organizational and procedural department should have all available methodical instructions on forms of medical aid to children in rural areas, information and reference materials and should practice effective propaganda and informational programs. A chart containing expert assessment of causes of death of children was discussed.
[279-2791]

UDC 362.147:614.253.58

IMPROVING PROPHYLACTIC WORK AT FELDSHER-MIDWIFE STATIONS

Moscow ZDRAVOOKHRANENIYE ROSSIYKOY FEDERATSII in Russian No 1, Jan 85
(manuscript received 10 Jul 84) pp 12-15

KAL'CHENKO, Ye. I., Department of Social Hygiene and Public Health
Organization (head-professor A. A. Balmasov), Leningrad Institute for
Advanced Training of Physicians

[Abstract] The vital role of feldsher-midwife stations in providing health care for the rural population is discussed and the importance of their effective operation is emphasized. The importance of organizational and methodical offices of central rayon hospitals in setting trends of operation of feldsher-midwife stations and ensuring efficiency of operation of these stations is discussed. Basic problems facing feldsher-midwife stations include: teaching rural people to assume major responsibility for their own health, to observe medical and hygienic norms of the socialist way of life and to promote environmental protection; provide effective and timely immunization programs; health protection for mothers and children; annual physical examinations of the population and also monitoring high risk groups and persons with chronic pathology. Means and methods for dealing with some of these problems are discussed briefly.
[275-2791]

PSYCHIATRY

UDC 616.891.4+616.8-009.17]-036.1-053.81

CLINICAL FEATURES OF ASTHENIA IN YOUNG ADULTS

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA
in Russian Vol 84, No 11, Nov 84 (manuscript received 26 Jun 84)
pp 1690-1695

KORKINA, M. V., TSIVIL'KO, M. A., KARNOZOV, V. L., KAREVA, M. A.,
BARINOV, A. M. and SOKOLOVA, O. N., Chair of Psychiatry and Medical
Psychology, Peoples' Friendship University imeni Patrice Lumumba, Moscow

[Abstract] Clinical, psychological and encephalographic evaluations were conducted on 293 young adults (18-28 years) with various forms of asthenia. Most of the male and female subjects were engaged in intellectual pursuits, and most of them were subjected to novel climatic conditions, language barriers, and/or separation from families. A variety of pathogenic factors leading to asthenia were identified, on the basis of which 5 etiologically related syndromes were defined: psychogenic asthenia, asthenia with cranio-cerebral trauma in the anamnesis, adaptational asthenia, somatogenic asthenia, and endogenous asthenia. In severe forms, asthenia was often complicated by marked affective disturbances, hypochondria, autonomic symptomatology, and pronounced personality disorders. In each case idiosyncratic manifestations were complemented by common features, both of which have to be considered in diagnosis and in therapy. References 32: 26 Russian, 6 Western. [1775-12172]

PSYCHOLOGY

MENTAL TELEPATHY: A REAL PHENOMENON OR CHARLATANISM

Minsk SOVETSKAYA BELORUSSIYA in Russian 16 Mar 85 p 4

MISYUK, N., doctor of medical sciences, head and professor, Chair of Nervous Diseases, Minsk Medical Institute; corresponding member, USSR Academy of Medical Sciences

[Abstract] None of the various claims for mental telepathy have actually withstood critical scientific scrutiny, although some have on occasion misled even highly gifted and regarded neurologists and psychiatrists. There are, it is true, the so-called extrasensory individuals that can perceive sensory stimuli through other than normal sense organs, such as Roza Kuleshova who could "see" with her skin as a result of having sustained encephalitis. Other individuals are described as hypersensory and can perceive stimuli not detected by normal individuals, much as a dog can hear high pitched sound not heard by man. There are many other phenomena which are claimed to impart to certain individuals special powers, such as "biofields" surrounding an individual as a result of electrical events in the body. However, such fields are extremely weak and of not consequence on others. Much remains to be done in the study of various such phenomena, but as yet convincing proof for the existence of mental telepathy has not been provided.
[1800-12172]

RADIATION BIOLOGY

UDC 577.112

TURNOVER OF CHROMATIN-BOUND AND MEMBRANE LIPIDS FROM LIVER AND THYMUS OF
GAMMA IRRADIATED RATS

Moscow BIOKHIMIYA in Russian Vol 49, No 12, Dec 84
(manuscript received 23 Apr 84) pp 2008-2011

KAZNACHEYEV, Yu. S., KOLOMIYTSEVA, I. K., KULAGINA, T. P. and
MARKEVICH, L. N., Institute of Biological Physics, USSR Academy of Sciences,
Pushchino

[Abstract] Study of rat liver and thymus, which differ greatly in radio-sensitivity and degree of proliferation, involved male Wistar rats (140-160 g), subjected to a 10 Gr dose of ^{137}Cs gamma rays and undergoing intravenous injection of $[2-^{14}\text{C}]$ acetate (7.4 MBq) in 0.5 ml of physiological solution 30 minutes before decapitation. Comparison of the metabolic activity of chromatin-bound lipids and lipids of intact nuclei and microsomes of the liver and nucleus of the thymus of irradiated and intact rats showed high metabolic activity of the chromatin-bound lipids, especially pronounced in the thymus cells. The higher specific radioactivity of the chromatin-bound lipids than that of corresponding lipids of the intact nuclei suggested structural uncoupling of chromatin lipids from other lipids of the nucleus. The degree of uncoupling in the thymus increased after irradiation. References 15: 8 Russian, 7 Western.
[1793-2791]

VIROLOGY

UDC 578.832.1:578.74].083.33

STUDIES ON HYBRIDOMAS PRODUCING MONOCLONAL ANTIBODIES AGAINST INFLUENZA
VIRUSES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 13 Mar 84) pp 22-24

KUSHCH, A. A., TSOY, L. A., ISAYEVA, Ye. I., ROVNOVA, Z. I., IVANOVA, L. A.,
YAMNIKOVA, S. S., RODOVA, M. A., YAKHNO, M. A., NABOKOVA, A. V.,
KOSYAKOV, P. N., L'VOV, D. K. and NOVOKHATSKIY, A. S., Institute of
Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Standard hybridoma technology was employed for the production of monoclonal antibodies against influenza A H1N1 viruses (A/Fml/47 and A/USSR/090/77), using splenocytes of immunized BALb/c mice fused with Sp2 or NS-1 mouse myeloma cells. Of the resultant 15 clones, 9 produced monoclonal antibodies against A/USSR/090/77 and 6 against A/Fml/47. Both immunofluorescence and hemagglutination inhibition techniques demonstrated the specificity of the antibodies for H1N1 viruses, and distinct differentiation from HON1 viruses. The clone cells differed from the parental myeloma cells, with the modal number of chromosomes ranging from 64 to 94, always exceeding the chromosome counts of the parental cells (56 chromosomes for NS-1, and 69 chromosomes for Sp2). Differential C staining of the chromosomes revealed unique marker chromosomes in 3 of the 11 clones so studied, that were not encountered in the parental myeloma cells. These antibodies should find wide application in the diagnostic differentiation of various influenza A viruses, since to date Soviet antisera could only distinguish between influenza A and B viruses. References 11: 5 Russian, 6 Western.
[1806-12172]

UDC 578.832.1:578.74].083.33

RADIOIMMUNOASSAY DETERMINATION OF ANTIGENIC CONCORDANCE AMONG HEMAGGLUTININS
OF VACCINE AND EPIDEMIC INFLUENZA VIRUS STRAINS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 29 Feb 84) pp 24-27

BLOKHA, V. V., YAMNIKOVA, S. S., KARPOVICH, L. G., YAKHNO, M. A. and
ZAKSTEL'SKAYA, L. Ya., State Scientific Research Institute of Standardization
and Control of Medical Biological Preparations imeni L. A. Tarasevich,
USSR Ministry of Health; Institute of Virology imeni D. I. Ivanovskiy,
USSR Academy of Medical Sciences, Moscow

[Abstract] Radioimmunoassay studies were conducted on the antigenic concordance
of hemagglutinin of influenza A H3N2 viruses, to determine the suitability
of vaccine strains in engendering immunity against viruses circulating in
nature. Specifically, the inhibition studies involved the hemagglutinins of
the A/Victoria/35/72 vaccine strain, the proposed vaccine strain
A/Khabarovsk/15/76, and the RK-5 recombinant strains, containing antigenic
determinants of viruses isolated in the 1972-1976 epidemic period
(A/Victoria/3/75, A/Leningrad/173/75, A/Victoria/112/76). The results
showed that A/Victoria/35/72 is becoming less important as a vaccine, but
that RK-5 and A/Khabarovsk/15/76 can provide significant immunity with
respect to influenza viruses circulating in 1975-1976. These observations
point to the usefulness of radioimmunoassay in assessing the suitability of
influenza A viruses for vaccine production. Figures 2; references 12;
5 Russian, 7 Western.
[1806-12172]

UDC 578.833.29: 78.224.083.3

COMPARATIVE STUDY OF OLIGOPEPTIDE MAPS OF VIRUS-SPECIFIC PROTEINS OF TICK-
BORNE ENCEPHALITIS VIRUS COMPLEX

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 14 Mar 84) pp 86-89

ZHANKOV, A. I., ZHDANOV, V. M., LYAPUSTIN, V. N., DZHIVANYAN, T. I. and
LASHKEVICH, V. A., Institute of Poliomyelitis and Viral Encephalitis,
USSR Academy of Medical Sciences; Institute of Virology imeni D. I. Ivanovskiy,
USSR Academy of Medical Sciences, Moscow

[Abstract] Oligopeptide maps were analyzed for virus-specific proteins of
the tick-borne encephalitis complex viruses, to determine the interrelation-
ship among the different viruses in the group. Analysis of the patterns for
Omsk hemorrhagic fever virus, Negishi virus, Langat virus, and Powassan
virus showed that the NV5 proteins possessed considerable similarities. In
the case of the tryptic products of V3 protein considerable differences were

evident on the maps, indicating marked differences in the amino acid composition of the protein components of V3. Extensive differences also apply to the NV3 protein. Analysis of NV4 and NV4 1/2 virus-specific proteins could not be carried out in this manner because of low levels of radioactive label uptake in tissue culture. Figures 3; references 10: 4 Russian, 6 Western.
[1806-12172]

UDC 578.833.2:578.224].083.3

ELECTROPHORETIC PATTERNS OF POWASSAN VIRUS VIRUS-SPECIFIC PROTEINS

Moscow VOPROSY VIROSOLOGII in Russian Vol 30, No 1, Jan-Feb 8
(manuscript received 3 Jan 84) pp 96-99

DZHIVANYAN, T. I., ZHANKOV, A. I., LASHKEVICH, V. A., BYCHKOVA, M. V.
and SARMANOVA, Ye. S., Institute of Poliomyelitis and Viral Encephalitis,
USSR Academy of Medical Sciences, Moscow

[Abstract] Comparative studies were conducted on the polyacrylamide gel electrophoretic patterns of the virus-specific proteins of Powassan virus and tick-borne encephalitis virus (Sofia), in an attempt to further define the taxonomic position of the former. In the high-MW zone Powassan was seen to produce proteins NV5 (p96), NV4 (p70), V3 (p56) and NV3 (p44). The pattern was essentially identical to that obtained with the tick-borne virus, with the exception that NV4 1/2 was irregular in appearance in the Powassan culture. In addition, 4 low-MW proteins were identified in the case of Powassan, designated as p23.5, p 23, p14 and p11, which could be presumed to correspond to NV2 1/2, NV2, NV1 1/2 and NV1 of mosquito-transmitted flaviviruses. These observations indicate that while Powassan has some general similarities to the tick-borne viruses, it appears to occupy a special position among the flaviviruses. Figures 1; references 20: 6 Russian, 14 Western.
[1806-12172]

UDC 616.831-002-022:578.833.26]-078.73

DETECTION OF ANTIBODIES AGAINST VIRAL ANTIGEN OF TICK-BORNE ENCEPHALITIS
IN PATIENT SERA BY COUNTER-IMMUNOELECTROPHORESIS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 3 Jan 84) pp 102-104

LYAPUSTIN, V. N., ANDREYEVA, Ye. B., PIVANOVA, G. P., KARAVANOV, A. S. and
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[Abstract] A counter-immunoelectrophoresis method was devised for the testing of patient sera for the presence of antibodies against the tick-borne encephalitis virus, for comparison with other standard techniques used in laboratory diagnosis. Analysis of 118 patient sera with the counter-immunoelectrophoresis technique yielded a 72% positive rate, versus 92% positive samples in hemagglutination tests, and 84% positives in complement fixation tests. While counter-immunoelectrophoresis was more sensitive than the Ouchterlony technique in the detection of specific antibodies, it appears to be suited as an adjunct test to hemagglutination and complement fixation for the diagnosis of tick-borne encephalitis, rather than as a definitive method of diagnosis despite its speed and ease of operation. Figures 1; references 13: 8 Russian, 5 Western.
[1806-12172]

UDC 578.82].83:578.833.29:57.083

PATHOGENIC POTENTIAL OF LYOPHILIZED OF SIMBU BUNYAVIRUSES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 30, No 1, Jan-Feb 85 p 128

ROLDUGINA, V. V., FADEYEVA, L. L. and SELEZNEVA, A. Yu.

[Abstract] A series of bunyaviruses of the Simbu group stored in the lyophilized state for 15 years at -20°C were tested for pathogenicity on a variety of animal models. The viruses were found to have completely retained their pathogenicity in the case of the susceptible animals; in some cases manifestations of pathogenicity required 5-7 passages in the animals in question. In the studies conducted, guinea pigs and rabbits were refractory to the viruses and responded with antibodies. Mice, rats and chick embryos were found to be highly susceptible. References 9. Manuscript deposited with VINITI on 23 May 84; No 3377-84.
[1806-12172]

STABILITY OF QUATERNARY STRUCTURE AND ANTIGENIC IDENTITY OF ADENOVIRUS
HEXONE CAPSOMERES

Moscow BIOKHIMIYA in Russian Vol 50, No 2, Feb 85
(manuscript received 28 May 84) pp 258-263

GRIGOR'YEV, V. G., KHIL'KO, S. N. and TIKHONENKO, T. I., Institute of
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[Abstract] A study was conducted on the correlation between the stability of hexone capsomeres derived from simian adenovirus SA7 and its antigenicity. The structural studies were conducted by a low-temperature modification of the SDS polyacrylamide gel electrophoretic method. Analysis of the results obtained with denaturing temperatures (100°C) and exposure to chemical denaturing agents showed that retention of quaternary structure was a prerequisite for antigenicity. In addition, stability patterns of the hexone capsomeres to the various denaturants indicated that the quaternary structure is maintained as a result of hydrophobic interactions in the core of the molecule. Figures 3; references 12: 1 Russian, 11 Western.
[1801-12172]

CONFERENCES

UDC 616.89:061.3(47+57)"1984"

THIRD ALL-UNION CONFERENCE ON BIOLOGICAL PSYCHIATRY

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA
in Russian Vol 84, No 11, Nov 84, pp 1748-1750

DOMASHNEVA, I. V., Moscow

[Abstract] The 3rd All-Union Conference on Biological Psychiatry was held on February 1-3, 1984 at the All-Union Scientific Center of Mental Health of the USSR Academy of Medical Sciences. This meeting concentrated on summarizing the achievements of a biological approach to mental illness, and the contributions of this approach to clinical psychiatry. The data presented covered the fields of physiology, psychopharmacology, neurochemistry, and neurogenetics. The conference was attended by more than 200 Soviet and foreign specialists, as well as representatives of the Psychiatric Department of WHO. Among the various reports were the interesting data garnered by V. P. Demushkin (Moscow) on the biochemorphological approach to assessment of the activities of psychotropic agents. The specificity of action of such agents appears to depend on the spatial configuration of these molecules and the distances between their functional groups. Such features can be used to predict pharmacological properties and in the directed synthesis of psychotropic agents. V. A. Gor'kova and E. I. Minsker (Moscow) covered the importance of pharmacokinetics in the optimization of psychochemotherapy. Recently, various clinical, pathophysiological, and biochemical indicators have been used to predict clinical efficacy, with greater or lesser degrees of success. Gor'kova and Minsker propose the use of individual pharmacokinetic data based on standard methods of mathematical statistics (discriminant analysis, chief component method, etc.). The use of this approach yields 80% predictive accuracy and, in general, such pharmacokinetic parameters yield predictive data similar to clinical data or exceeding the latter. Combined use of the clinical and pharmacokinetic approaches reduced prognostic error rate 1.5-3-fold. V. I. Poltavets (Dnepropetrovsk) reported long-term studies on the genetic aspects of alcoholism, and the results of large-scale questionnaire approach to rapid diagnosis of alcoholism. A description was provided on the collation of primary data and the identification of quantitative traits indicative of the disease. Poltavets gave a description of frequency analysis of alcoholism morbidity in the population and family incidence in relation to consanguinity.

Risk factors were analyzed based on polysibling families in relation to family history and extant familial and environmental factors. The conference concluded with a look at the promising future of biological psychiatry and a press conference.
[1775-12172]

UDC 362.147:616-053.2]-22(063)

REPUBLIC SEMINAR OF PEDIATRICIANS FOR EXCHANGE OF EXPERIENCE CONCERNING
DISPENSARIZATION OF CHILDREN LIVING IN RURAL AREAS

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 12, Dec 84, pp 55-57

DERYUGINA, M. P., Minsk

[Abstract] Proceedings of a republic seminar held in Korbin 28-29 July 1984 were discussed. L. V. Paraskevich, head of the Board of Medical and Occupational Assistance to Mothers and Children of the BSSR Ministry of Health reported that dispensarization [annual preventive medical checkups] of all children is being carried out in 3 stages: improvement of prophylactic measures among healthy children, detection of children at high risk and improvement of their health and detection of children with a chronic pathology and rehabilitation of them. The importance of health care for children in the first 3 years of life, when child mortality is highest, was emphasized. Other subjects discussed included: differences in health care for rural children from that for urban children, aspects of organization of health care for children in rural areas, procedures for visits of medical experts to rural areas and transfer of children needing special care to large municipal hospitals, detection of stertor forms of diseases of the kidneys, liver, intestines and heart of children and their treatment, importance of improvement of prophylactic work with healthy children and rehabilitation of ill children, aspects of care of children with allergies, hematological, orthopedic or neurological diseases, treatment of chronic diseases of the digestive tract in children and work of sanitation activists.
[217-2791]

MISCELLANEOUS

BRIEF

FIRST ISSUE OF MEDICAL NEWSPAPER--The first issue of the high-circulation newspaper SOVETSKIY VRACH from the Leningrad Order of Lenin Institute of Advanced Study for Physicians imeni S. M. Kirov has been published. This event occurred on the eve of the New Year, 1985, in which the State Institute of Advanced Training of Physicians, the oldest in the world, will celebrate its 100th anniversary. The leading article by Prof. S. A. Simbirtse, rector of the institute, sets forth the results of the collective's work. The article notes that each year more than 10,000 physicians and engineering-technical workers pass through the institute's 60 departments and 16 courses. [By. M. Shernyakov, docent, Leningrad] [Text] [Moscow MEDITSINSKAYA GAZETA in Russian 9 Jan 85 p 3] 12255

COOPERATION OF SOVIET AND INDIAN SURGEONS

Moscow MOSCOW NEWS in English No 47, 2-9 Dec 84, p 10

[Article by Maria Gryzuna]

[Text] "This is a splendid Center, outstanding in your country and, perhaps, in the world. It is a gift not only to the Soviet people but also to other peoples." These remarks were made by Professor G. B. Parulkar, a noted Indian cardiologist from Bombay. Together with a group of physicians active members of the Indo-Soviet Cultural Society and Friends of the Soviet Union Society, he was taken on a tour of the All-Union Cardiological Center of the USSR Academy of Medical Sciences.

Prof. Parulkar led a delegation which took part in the Soviet-Indian medical symposium in Moscow arranged on the initiative of the Soviet-Indian Friendship Society.

Exchanges of ideas are always beneficial and the Soviet participants in the symposium that discussed the latest surgical achievements in the USSR and India, as well as the contribution of the medical profession to the peace campaign, were shown color slides illustrating methods of heart surgery pioneered at Prof. Parulkar's clinic in Bombay. They were also brought up-to-date on methods for treating mitral stenosis used by Indian physicians.

Soviet cardiologists spoke highly of their Indian colleagues' professional skills and shared with them their achievements. The medical service and surgery in the USSR are of very high standards. This was the view of all members of the Indian delegation. Protecting health, the Soviet and Indian physicians voiced their fears for mankind's future in view of the deterioration in the international situation, and stated that their duty in these conditions was to fight for peace and to save mankind from death.

[CSO: 1840/159]

DEATH OF DIVER IN TROITSA BAY

Moscow IZVESTIYA in Russian 4 Mar 85 p 3

PUSHKAR', A., special correspondent, Vladivostok-Moscow

[Abstract] A diving accident took the life of Valeriy (Alik) Kiselev, one of the USSR's most experienced divers, in the Troitsa Bay. The event was an unscheduled dive made with visiting divers from Moscow, Vladimirov and Dutoy, who prevailed upon him against his better judgement. An inquiry revealed some of the conditions leading to the accident, although the exact details remain a mystery because of the disorientation of the two accompanying divers. Suffice it to say, that it was only Kiselev's good nature and desire to be of service that led him to the fatal dive that took his life. Part of the blame is also to be put on the faulty diving equipment with which he had to contend, and it remains a scandal that to this day our divers do not have scuba gear and other diving accouterments made in the USSR. For every need they have to rely on foreign equipment. What is also of concern is the cavalier attitude of Vladimirov and Dutoy, and the fact that they have gotten away unscathed, without even an official reprimand being issued. Won't that lead to a new tragedy?
[1790-12172]

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